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The Surgical Treatment of Portal Hypertension

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SUMMARY

Portacaval shunt operations were done in 15 of 18 patients who were treated surgically for portal hypertension. In eight cases the shunt was established by splenorenal anastomosis; in seven by anastomosis of the portal vein to the side of the inferior vena cava. Of the eight patients with splenorenal shunt, two are well, four are considered improved, and two have died. Of the seven in whom the portal vein was joined to the vena cava, two are improved, one is unimproved, and four have died.

BLAKEMORE and Lord[1] and Whipple[17] stimulated renewed interest in the problem of portal hypertension with their reports in 1945 of successful venous anastomosis which permitted portal blood to flow directly into the systemic circulation, bypassing obstructions in the usual portal pathway. Their original technique of performing the venous anastomosis with vitallium tubes has been supplanted by the method of direct suture anastomosis. The principle of the venous shunt, however, remains as one of the most effective methods of relieving portal hypertension. Von Eck[5] in 1877 performed the first portacaval anastomosis in dogs, using a side-to-side technique that has become known as the Eck fistula. Whipple[18] has observed dogs with Eck fistulas for as long as eight years. These animals had occasional episodes which were attributed to disturbed protein metabolism, but they generally maintained a satisfactory state of health. Prior to the reports of Blakemore, Lord and Whipple, isolated attempts had been made to apply this principle of shunting blood directly into the systemic circulation in cases of portal hypertension. Minor branches of the portal and systemic system were usually employed and thrombosis at the site of anastomosis invariably accounted for the failure of the procedure.

Blood carried into the portal area passes through two capillary systems before returning to the heart. It passes through a set of capillaries in the viscera, from which it is collected into the veins of the portal system and is then carried to the second set of capillaries in the liver. From here, it is returned to the heart by way of the inferior vena cava. Any condition which inhibits the free flow of blood in the portal system into the inferior vena cava usually increases the pressure of the blood in all or a part of the portal system.

Patients with an elevation of the venous pressure in the portal system may be divided into two main groups as suggested by Whipple: Group I, those having an intrahepatic portal block; and group II, those having an extrahepatic block.

INTRAHEPATIC BLOCK

Intrahepatic block is usually associated with cirrhosis of the liver. The actual cause of portal hypertension in cirrhosis has not been clearly demonstrated. It has been suggested that intrahepatic fibrosis narrows the lumen of the portal vein

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branches inside the liver and that the resulting increased resistance to the flow of blood is responsible for the elevated pressure.

Herrick's[7] studies of increased portal pressure in cirrhosis emphasized the communication of the portal venous system and the hepatic arterial system in their smaller branches inside the liver. The studies also emphasized the pronounced effect on portal pressure occasioned by slight increases of hepatic arterial pressure in the cirrhotic liver. In the normal liver Herrick found a rise of 1 mm. of mercury in the portal pressure for every 40 mm. elevation of arterial pressure. In the cirrhotic liver there was 1 mm. rise of portal pressure for every 6 mm. elevation of arterial pressure. Gad[6] also demonstrated that increased pressure in the hepatic artery retarded the portal flow.

McIndoe[9] failed to confirm these findings of the effect of the arterial pressure changes on the portal pressure. However, he made the important observation that only 13 per cent of fluid that perfused through the portal vein in the cirrhotic liver could be recovered from the hepatic vein; the remainder was lost through collateral vessels. McIndoe concluded that the elevated portal pressure resulted from a gradual shutting off of portal blood from the hepatic cells as interlobular fibrosis increased.

The case histories of 65 patients admitted to the Wadsworth Veterans Hospital with a diagnosis of cirrhosis of the liver have recently been reviewed. The average age of the patients in this all-male series at the time of admission was 51 years. Eighty-one per cent of the patients were between 40 and 60 years of age. All the patients with advanced cirrhosis had histories of excessive alcoholic intake and many of the acute exacerbations of their illnesses were preceded by bouts of heavy drinking.

In 33 of the cases there was evidence of esophageal or gastric varices with bleeding into the alimentary tract. Ascites was present in 50 of the patients, and 19 had both varices and ascites. Active duodenal ulcer was demonstrated in four cases.

In 58 cases with complete follow-up records, there were 30 deaths, a mortality rate of approximately 52 per cent. The immediate causes of death were as follows: Hemorrhage into the gastrointestinal tract in 15 cases, hepatic failure in 10 cases, and miscellaneous causes in five cases. The duration of the disease in relation to the cause of death is indicated in the following table:

Duration of disease	Number of patients	Living	Dead	Cause of death*		
				Hem.	Hep.	Other
0 - 3 mo.	8	4	4	1	2	1
3 mo. - 1 yr.	6	3	3	1	2	
1 yr. - 3 yr.	25	10	15	8	5	2
3 yr. - 10 yr.	14	8	6	5	1	
10 yr. plus	4	3	1			1
Unknown	1	0	1			1
Total	58	28	30	15	10	5

Mortality rate, 52 per cent.

*Hem.: Hemorrhage. Hep.: Hepatic failure.

Ratnoff and Patek[14] reported that 40 per cent of patients who have hemorrhage from esophageal varices die within one month of the first hemorrhage.

It is obvious that the prognosis for the cirrhotic patient in the past has been grave. Although portal hypertension is only a secondary manifestation of the primary disease process in the liver, a high percentage of cirrhotic patients die as a result of events directly related to the increased portal tension. It would follow that an acceptable period of palliation might be anticipated if the venous pressure in the portal system could be reduced. The most satisfactory results would be obtained in inactive cases and in those cases in which the disease process in the liver was least severe.

Blakemore[2] classified cases of cirrhosis into three groups in regard to their suitability for operation: Group I, cases in which ascites or tendency to hemorrhage is based on the inability of the damaged liver to form albumin or prothrombin in adequate amounts. Portacaval anastomosis is not indicated in this group. Group II, cases in which the liver function is adequate to furnish the required amount of protein and prothrombin but in which a severe degree of portal hypertension has supervened as a result of fibrotic contraction and periportal fibrosis. Wasting ascites and severe hemorrhage can be controlled in this group by portacaval shunt. Group III, cases in which there are varying degrees of depressed liver function plus evidence of considerable elevation of the portal pressure. These cases must be considered individually and the response of liver function under treatment observed over a period of time. Certain of the patients will be candidates for operation, but the optimum time for operation must be carefully selected. Patients with massive recurrent hemorrhage, at times, may be operated upon despite an inadequate period of preparation. If the liver function is seriously depressed at the time of operation, the prognosis is grave, even though a successful anastomosis is completed.

EXTRAHEPATIC BLOCK

There are two conditions which may cause an extrahepatic block: (1) splenic vein thrombosis, or (2) a block in the portal vein, resulting in portal hypertension.

Splenic vein thrombosis. If the block or thrombosis occurs in the distal portion of the splenic vein and interferes solely with return of blood from that organ, enlargement of the spleen occurs and there may be anemia and leukopenia, the result of so-called hypersplenism. Enlarged collateral vessels usually develop in the vasa brevia between the spleen and the stomach, but gross bleeding into the alimentary tract does not occur. For this condition splenectomy alone will provide adequate relief of the patient's symptoms. Such isolated thrombosis of the splenic vein is quite rare but it undoubtedly accounts for the occasional satisfactory result which has followed splenectomy in the treatment of patients with Banti's disease in the past.

Should the thrombus be proximal to the junction

of the splenic and coronary veins, however, and thereby obstruct the blood flow of the coronary vein from the lower esophagus and the lesser curvature of the stomach, the patient will eventually develop gastric and esophageal varices with resulting hemorrhage into the alimentary tract. Splenectomy alone in such cases will not permanently alleviate the dilatation of the gastric and esophageal veins. Such a condition occurs so regularly in cases with Banti's disease that Blakemore, Welch, Linton and others have strongly advised against splenectomy alone unless the surgeon can be certain that the pressure in the coronary vein is not elevated and that the block is confined to the splenic vein. Thrombosis of the splenic vein following splenectomy eliminates the possibility of performing a splenorenal vein anastomosis and thereby removes the best opportunity the patient has for relief of the hypertension in the coronary vein.

Portal hypertension resulting from a block in the portal vein. Although the entire visceral venous bed is usually referred to as the portal system, the portal vein *per se* is formed at the juncture of the splenic and superior mesenteric veins. This vein lies, for the most part, in the posterior part of the hepatoduodenal ligament and runs from the under or dorsal surface of the head of the pancreas to the hilus of the liver. Acute blockage of the portal vein from trauma or sudden complete thrombosis in man is usually fatal. There are three conditions which may obstruct the portal vein and produce hypertension throughout the portal system.

(a) "Cavernous transformation" of the portal vein. The origin of this condition is uncertain but it is usually thought to be a condition which arises early in the life of the individual either as a congenital malformation of the portal vein, as an extension of the obliterative process in the ductus venosus to involve the portal vein, or as a result of an inflammatory thrombosis arising from an infection in the umbilicus extending down the umbilical vein to involve the portal vein. Exploration of the hepatoduodenal ligament in later years will reveal a number of dilated, thin-walled tortuous veins instead of a single large portal vein, whence the name, "cavernous transformation."

(b) Thrombosis of the portal vein. At any age the portal vein may be the site of formation of a thrombus. Such a condition may be associated with an inflammatory process in the abdomen, or develop following trauma to the abdomen. More frequently it is idiopathic or of unknown origin. The process probably starts as a partial obstruction, but it may progress to complete occlusion of the portal vein followed by the development of collateral vessels in the hepatoduodenal ligament and other collateral areas.

(c) External compression. The portal or splenic veins may be obstructed by an adjacent inflammatory cicatrix associated with pancreatitis or cholecystitis; rarely, neighboring tumors or cysts may, by compression, interfere with portal blood flow.

SYMPTOMS ASSOCIATED WITH PORTAL HYPERTENSION

The symptoms frequently associated with portal hypertension may be grouped in the following manner, although clinically they may appear singly or in combination:

1. Effects due to enlargement of the spleen. The anemia and leukopenia in cases of Banti's disease are usually attributed to the effects of hypersplenism.

2. Effects of collateral circulation. Certain collateral vascular systems become established when portal obstruction and hypertension persist. These are described as follows:

(a) Accessory portal veins of Sappey. These are multiple small veins about the liver and portal vein, which communicate through the subdiaphragmatic and retroperitoneal areas with the systemic system. Included in this group are the vessels which course along the ligamentum teres to the umbilicus to anastomose with the epigastric veins in the abdominal wall. Clinically, the presence of such veins is often helpful in indicating portal obstruction as the superficial abdominal veins become dilated, and rarely a cluster of veins about the umbilicus, the caput medusa, may be visible.

(b) Veins of Retzius in the retroperitoneal area are important collateral vessels but are usually not demonstrable.

(c) Hemorrhoidal veins. The collateral anastomosis between the superior and inferior hemorrhoidal veins produces internal and external hemorrhoids.

(d) Cardiac and esophageal veins. Collateral pathways may be established to carry blood through these veins into the azygos system. Bleeding from these veins is, of course, one of the prime symptoms of portal hypertension.

3. Abnormal filtration through portal bed. The formation of ascitic fluid does not occur in cases in which obstruction is confined to the splenic vein. It occurs infrequently in cases in which there is obstruction of the portal vein but in which liver function is normal.

Ascites is frequently observed in the cirrhotic patient. Here it is undoubtedly produced by a combination of factors: (a) The increased hydrostatic pressure inside the branches of the portal vein; (b) disturbance of the normal constituents of the serum (a result of impaired liver function), the disturbance resulting in the passage of fluid from the veins into the peritoneal cavity. The relative importance of these two factors must be weighed in considering operation to reduce portal hypertension.

OPERATIVE PROCEDURES

The operative procedures which have been advocated in the treatment of portal hypertension or its secondary manifestations may be listed as follows:

I. Drainage procedures: (a) Insertion of glass button into abdominal wall; (b) saphenoperitoneal anastomosis; (c) pyeloperitoneal anastomosis.

II. Portal-systemic venous shunt: (a) Omento-

pexy; (b) portacaval, splenorenal and other direct venous anastomoses.

III. Direct treatment: (a) Injection of esophageal varices; (b) ligation of varicosities; (c) esophagogastric resection; (d) mediastinal packing.

Crosby and Cooney[4] in 1946 reported six cases in which patients with pronounced ascites were treated by the insertion of a glass button of original design into the lower abdominal wall; a procedure which permitted the escape of ascitic fluid into the subcutaneous tissue. All the patients were considered benefited by the procedure. The longest period of postoperative observation was 11 months. Lord[8] subsequently added two modifications to the procedure: The creation of a large subcutaneous pocket and the removal of fascia overlying the abdominal muscles. The author's experience with this procedure in three cases in which the modification of Lord was used was unsatisfactory. However, in one patient recently observed, ascites had been controlled satisfactorily for 18 months after insertion of a Crosby-Cooney glass button at another hospital. When the patient was observed by the author, intractable ascites had returned, apparently from lack of absorption of fluid in the subcutaneous tissue.

Isolated reports of successful saphenoperitoneal and pyeloperitoneal anastomoses have appeared, but the methods have never been widely used. Intraperitoneal obstruction of the ostia of such anastomoses would seem likely. The results of the various omentopexy procedures have been uniformly disappointing.

Bleeding from esophageal varices has been satisfactorily controlled by the injection of sclerosing solutions into the veins.[10, 11] Although such injections may obliterate certain of the collateral channels without reducing the portal hypertension, the procedure probably should be more widely used as a palliative measure in cases of cirrhosis with bleeding varices and extensive hepatic damage.

Som and Garlock[16] have reported two cases in which bleeding from esophageal varices was relieved by the packing of gauze about the esophagus in the upper mediastinum. It was felt that the pack promoted the formation of granulation tissue and the subsequent development of collateral vessels between the esophageal veins and the deeper venous channels of the mediastinum.

An esophagogastric resection in treatment of bleeding varicosities was reported by Phemister and Humphreys[13] in 1947. They suggested that the probable source of bleeding in cases of portal hypertension in which no gross bleeding point could be found was the engorged venocapillary network in the mucosa. Shafer[15] recently reported encouraging results in the treatment of six patients by this method.

Pattison[12] reported 14 cases of cirrhosis of the liver in which exploration was carried out. In ten of the cases a portacaval shunt was performed. There was one postoperative death. Numerous other small series or single successful cases have been reported; however, the great operative difficulties, arising chiefly from extensive collateral vessels, and the frequent occurrence of serious postoperative complications such as thrombosis at the site of anastomosis, adherence and closure of the suture line, and hepatic failure have made many surgeons question the ultimate usefulness of venous anastomosis in the treatment of this condition.

The direct shunt of blood from the portal system to the systemic circulation by means of venous anastomoses would seem to offer the most satisfactory method of reducing portal hypertension for a prolonged period. Blakemore[3] recommended anastomosis of the portal vein to the inferior vena cava whenever possible. The progress of four patients with anastomosis of this type was followed by him for more than two years. Response of hepatic function to this type of shunt did not appear to differ from that observed in patients in whom the splenorenal type of shunt had been employed. In Blakemore's series of 60 cases there were 11 postoperative deaths following portacaval anastomosis.

The following data were obtained through the study of 18 patients with portal hypertension treated surgically by the author or other members of the staff of Wadsworth Veterans Hospital:

Six of the patients are known to have died since operation. One patient who had total gastrectomy and esophagojejunostomy for hemorrhage has had no further bleeding in the three years since operation. Two were treated by splenectomy alone because a satisfactory vein for anastomosis could not be found in the splenic pedicle. One of them has shown improvement over a short postoperative period; the other has continued to have hematemesis and is unimproved.

Portacaval shunt operations were done in 15 cases. In eight of the 15, splenorenal anastomosis was used, with the following results: Two of the patients are well, four are considered improved, and two have died. In the remaining seven cases, the end of the portal vein was anastomosed to the side of the inferior vena cava. The results: Two of the patients are considered improved, one is unimproved, and four have died.

Of eight patients with intrahepatic block who were subjected to portacaval shunt, four are improved, one is unimproved, and three have died. Of ten patients with extrahepatic block, six are improved postoperatively, one is unimproved, and three have died.

In the six cases in which the patient died, the duration of life after operation, and the cause of death were:

	Survival	Cause of death
1.	7 days	Thrombosis at site of anastomosis
2.	5 days	Portal vein found thrombosed at time of exploration. Thrombus removed and portacaval anastomosis performed. Thrombus reformed with extension
3.	10 days	Hepatorenal failure
4.	3 days	Extensive pancreatic necrosis
5.	4 months	Closure of anastomosis
6.	47 days	Hepatic failure

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The Use of Aerosol Penicillin and Streptomycin in Bronchopulmonary Infections

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SUMMARY

Three hundred patients with subacute or chronic non-tuberculous bronchopulmonary disease were given aerosol therapy, chiefly penicillin and more recently penicillin combined with streptomycin. The result showed that the inhalation of these antibiotics is a useful procedure in the treatment of tracheobronchitis, either subacute or protracted, or in association with bronchial asthma, bronchiectasis or pulmonary emphysema. The method of administration is simple.

VOLUMINOUS literature[11] during the past several years testifies to the intense interest in the use of aerosol therapy in bronchopulmonary disease. Much of the basic aerosol work was carried out by Barach,[2, 3] Segal,[9, 10] Olsen,[7] and Bryson,[5] but a significant earlier contribution (1935) was the nebulization of 1:100 epinephrine solution by Graeser and Rowe[6] for the relief of bronchial asthma. Later, the sulfonamides[1] and sulfones[4] were subjected to nebulization. It was only natural that attempts would be made to nebulize penicillin into the lungs.[3] Eventually, streptomyin was similarly used.[8] It is apparent that a new method of administration of drugs by inhalation has been opened to the practicing physician. There have been both enthusiasm for and criticism of this method in the treatment of bronchial asthma, pneumonia, bronchiectasis, lung abscess, chronic bronchitis and sinusitis.

Since December 1944, the authors have used penicillin aerosol and more recently a combination of penicillin and streptomycin in approximately 300 patients with various non-tuberculous bronchopulmonary infections.

MATERIAL AND METHODS OF STUDY

The 300 patients were studied in regard to respiratory tract infection. In each instance, a complete history was taken and physical examination was followed by fluoroscopy and/or x-ray examination of the chest. Laboratory work included blood cell counts, sedimentation rate determination and routine sputum examinations usually before and after aerosolization. Bronchoscopy and bronchography were carried out when indicated.

Presented in part at Highland-Alameda County Hospital Teaching Program December 15, 1949, and at a Staff Meeting of East Oakland Hospital in November 1949.

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As shown in Table 1 the types of bronchopulmonary disease under study fall into five principal categories: (1) subacute or protracted tracheobronchitis, (2) chronic bronchiectasis, (3) pulmonary emphysema with respiratory infection, (4) bronchial asthma with superimposed respiratory infection, and (5) bronchopneumonia.

The equipment for the administration of the aerosol penicillin and streptomycin consisted of a 160-gallon portable oxygen tank with a flowmeter and a Vaponefrin® or Asthmanephrin® nebulizer. Crystalline penicillin G was put in a saline solution so that each cubic centimeter contained 50,000 units. When streptomycin was added each cubic centimeter of solution contained 100 mg. of the antibiotic. In addition, from 0.5 cc. to 1 cc. of 1 per cent phenylephrine was added to each 200,000 units of penicillin solution. Inhalations were given at home or in hospital every three hours for three to five days or longer as the case required. A codeine cough mixture was routinely administered every three to four hours in those patients with moderate or severe cough in an effort to reduce loss of the antibiotic.

EVALUATION OF RESULTS

Since cough and expectoration are a common denominator of bronchopulmonary disease, evaluation of the results of aerosol therapy centered about these symptoms. In addition, the volume of sputum was roughly measured before and after treatment,* the character of it was noted and a routine Gram stain was made. Conversion from a copious amount of mucopurulent or purulent sputum containing numerous Gram-positive and/or Gram-negative organisms to a small amount of clear or mucoid sputum in which there are few or no organisms on Gram stain was considered a reasonable indication of a satisfactory result with aerosol therapy. Invariably when such changes take place, cough subsides or disappears, fever (if present) abates, and rales diminish in number or disappear. Evaluation of the results of the treatment of asthma and bronchopneumonia will be considered separately.

RESULTS OF TREATMENT

Group 1: *Subacute or protracted tracheobronchitis*† (131 cases). In this group of patients, who

*A reduction of 75 per cent or more in the volume of sputum is considered a good result, a 50 per cent reduction a fair result, and 25 per cent a poor result.

†This group comprises only those cases in which there was bacterial inflammation of the trachea and larger bronchi complicating the usual upper respiratory illness called the "common cold." As far as possible patients with underlying pathologic conditions such as bronchiectasis were excluded from Group 1 and placed in the appropriate subsequent group.

TABLE 1.—*Results with Penicillin Aerosol Therapy*

Diagnosis	Number of Cases	Reduction in Cough and Sputum		
		More than 75%	50%	Less than 25%
Subacute or protracted tracheobronchitis	119	98	16	5
Chronic bronchiectasis	47	25	15	6
Pulmonary emphysema with respiratory infection	46	28	12	6
Bronchial asthma with respiratory infection	30	21	8	1
Bronchopneumonia	21	19	2	0
Totals	263	191	53	18

invariably described their illness as a "chest cold that hangs on," results with aerosol therapy were uniformly gratifying. The usual duration of the "chest cold" before the inhalational routine was started was 14 to 28 days, but in many instances it was six to eight weeks. During this interval the majority of patients had received some form of treatment including "shots of penicillin" or "sulfa," cough mixtures and other remedies. As a rule, 24 hours after the onset of the aerosol treatment the cough subsided, the sputum became less purulent and was reduced in amount. In the majority of instances bronchopulmonary symptoms were minimal in degree after 72 hours of inhalational therapy. In the remainder of the series it was necessary to prolong the inhalations for several days to effect clinical cure. In those cases in which recovery was delayed either the patients had failed to take the inhalations correctly or they harbored penicillin-resistant organisms in the sputum. Much of the latter was later remedied by adding streptomycin to the aerosol. Finally, in some of the cases in which results following nebulization were unsatisfactory, it was found that a more serious underlying disease was being masked by the tracheobronchitis. As shown in Table 1, 119 patients with tracheobronchitis received penicillin aerosol. Of this number 98 had better than 75 per cent reduction in cough and sputum, 16 had a 50 per cent reduction and five a reduction of less than 25 per cent. Results with combined antibiotic aerosol therapy were satisfactory in 12 cases of subacute or protracted tracheobronchitis in which the treatment was used.

Group 2: *Chronic bronchiectasis* (60 cases). In the majority of patients in this group, tracheobronchitis caused an acute flare-up of the disease and brought the patient under treatment. The 24-hour collection of sputum was usually several ounces or more of thick, grayish green or yellow purulent or mucopurulent exudate. Following several days of inhalation of the antibiotics the sputum was usually reduced in amount, had thinned out, was less purulent or more mucoid in character. Accompanying these changes was a corresponding reduction in cough and abatement of fever and malaise. The best results were obtained in those cases in which combined penicillin and streptomycin was used. It was necessary to employ the procedure for at least seven to ten days in the average case to insure the best possible result, and several patients in the series required a much longer schedule of treatment. Benefit, however, was usually only temporary, lasting from several days to several months. As shown in Table 2, 47 patients with bronchiectasis had penicillin inhalations. Good results were obtained by 25 of them and fair results by 15; six patients were little benefited. Results were better, however, in those patients given combined antibiotics (Table 2).

Group 3: *Pulmonary emphysema with respiratory infection* (51 cases). The patients in this group, chiefly males over 50 years of age, had chronic productive cough usually associated with dyspnea and some wheezing. Many of the patients were diagnosed either as asthmatic or as having so-called chronic bronchitis. Question arose as to the coexistence of bronchiectasis in these patients. Undoubtedly, such was often the case but bronchographic proof is lacking. However, in almost all cases acute tracheobronchitis complicated the chronic process and brought the patient under medical care. Results* with aerosol therapy were generally encouraging, as noted in Tables 1 and 2. Of the 51 patients, 33 experienced satisfactory reduction of the productive cough, 12 others had a fairly good result, but six received little benefit. It was of interest that several of the latter seemed to derive more benefit from mercurial diuretics than from antibiotics, suggesting an element of congestive heart failure was present rather than (or in addition to) infection.

*As in Group 2 it was usually necessary to continue the aerosol therapy for a longer period than for Group 1.

TABLE 2.—*Results with Combined Antibiotic Aerosol Therapy*

Diagnosis	Number of Cases	Reduction in Cough and Sputum		
		More than 75%	50%	Less than 25%
Subacute or protracted tracheobronchitis	12	12	....	....
Chronic bronchiectasis	13	11	1	1
Pulmonary emphysema with respiratory infection	5	5	....	....
Bronchial asthma with respiratory infection	11	10	1	....
Bronchopneumonia	2	2	....	....
Totals	43	40	2	1

Group 4: *Bronchial asthma with respiratory infection* (41 cases). In patients in this group a "chest cold" (tracheobronchitis) seemed to act as a trigger mechanism in precipitating the attack of asthma. Relief of the asthma was difficult and often impossible with the usual "asthma" drugs unless the infection was first effectively treated. Aerosol penicillin and streptomycin were used to treat the bacterial infection, and following this the various sympathomimetics, antihistaminics, etc., were effective in relieving the asthma. In no instance of asthma without infection was antibiotic aerosol therapy of any value. In Table 1 are listed results of aerosol penicillin in 30 Group 4 patients. Twenty-one had satisfactory improvement in the respiratory infection and eight had fairly good results. Results with combined antibiotics in ten patients were quite gratifying (Table 2). In 32 of the 41 patients in the group, the asthma was rather promptly brought under control by means of antihistaminics, bronchodilators, etc., after treatment with aerosol antibiotics.

Group 5: *Bronchopneumonia* (23 cases). This group comprised patients who sought medical care because of a "heavy chest cold." Bronchopneumonia in these patients was in each instance a sequel of tracheobronchitis—in fact the culmination of severe descending respiratory tract infection. Fever, malaise and productive cough were present. Fluoroscopic examination usually supplemented by roentgenograms of the chest revealed a significant patch or several patches of infiltration in the lung. Subsequent sputum examination was negative for tubercle bacilli but on Gram stain numerous Gram-positive organisms were found. Aerosol therapy cleared the infiltration in all cases. Resolution of the pneumonic exudate seemed slower in emphysematous subjects. Table 1 shows results of penicillin aerosol in 21 patients with bacterial bronchopneumonia.

DISCUSSION

The results of this study, in agreement with those of other investigators,[2, 7, 9] show that aerosol therapy is a useful procedure in the treatment of some of the common non-tuberculous bronchopulmonary diseases. Inhalation of antibiotics has no place in the treatment of the common cold. Nor is there a valid indication for use of the method in the treatment of allergic non-infective bronchial asthma. But in the complications of these diseases, in purulent tracheobronchitis usually called a "chest cold" by laymen and physician alike, aerosol penicillin and/or streptomycin (depending on the bacterial flora) is a promptly effective form of treatment. The same holds true when infection—bacterial tracheobronchitis, for example—complicates bronchial asthma or pulmonary emphysema. In that circumstance, inhalation of the appropriate antibiotic often cures the infection, permitting effective action of "physiologic therapy"[2] for the underlying disease.

The best treatment for bronchiectasis is lobectomy. Olsen[8] demonstrated the value of preoperative aerosol therapy in patients with this disease: The pronounced reduction of purulent sputum following inhalational therapy both eased the operative difficulties and diminished complications. The authors' experience coincides with that reported by Olsen. However, lobectomy is not suitable for all persons with bronchiectasis. In this unfortunate group of patients aerosol therapy has afforded significant even though only temporary benefit. Inhalation of the antibiotic has proven of greater value than parenteral administration. Inhalational therapy is, after all, topical therapy to the inflamed respiratory passages.[5] Hence, the factor of maximum local concentration of the antibiotic used is of fundamental importance in explaining the superiority of the aerosol route over the parenteral route of administration. Furthermore, a congested edematous bronchial membrane pouring out mucoid, mucopurulent or purulent exudate will interfere with the permeability of the diffusion surface (mucosa) and retard absorption of the antibiotic through it, with the result that higher and more prolonged concentration of the antibiotic is attained by topical application. In addition, impaired blood supply in scarified dilated bronchi, as in bronchiectasis, interferes with the injected drug's reaching the infected area. On the other hand, the mechanical factors of viscosity and thickness of purulent secretions probably play a role in retarding the effectiveness of topical therapy.[5] Because of these interfering factors, detergents (Zephiran®) are now being used in combination with the antibiotics for nebulization. As detergents have emulsifying properties and lessen surface tension, they liquefy purulent exudate and permit more uniform and better penetration of the antibiotic.

There seems to be rather limited indication for aerosol therapy in bacterial bronchopneumonia. Parenteral administration of antibiotics is surely the method of choice for patients with that disease. However, in cases of bacterial bronchopneumonia in which the lungs are emphysematous, or when the disease complicates bronchiectasis, the inhalational route has seemed to speed resolution of the inflammatory process. Perhaps this is related in part to the previously mentioned factor of poor blood supply in such cases.

Early experience of Barach, Olsen and others with use of a single antibiotic in aerosol therapy showed that only Gram-positive organisms disappeared from the sputum. Following nebulization, considerable pulmonary exudate often remained and clinical improvement was not fully satisfactory. Sputum analysis showed that numerous Gram-negative organisms remained. The experience of the authors of this presentation in this regard has been similar. Streptomycin was thus the logical drug to use in such cases because of its bacteriostatic effects on Gram-negative organisms. Furthermore, Abraham and Chain (cited by Olsen[8]) found that these Gram-negative organisms elaborate an enzyme, penicillinase, which inactivates penicillin. In view of this the authors routinely made a Gram stain of sputum prior to antibiotic therapy; whether to use a single antibiotic or a combination was determined on the

basis of results of examination of the stained material. In actual practice, almost all sputum contains both Gram-negative and Gram-positive organisms, thus indicating the need for combined antibiotics in aerosol routine.

Various other drugs—detergents,[5] bronchodilators,[2] and bronchovasoconstrictors[2]—have been combined with the antibiotics used in aerosol therapy. In the authors' experience, 1 per cent phenylephrine seemed to enhance the value of the aerosol, probably due to bronchovasoconstricting qualities, thus slowing absorption of the antibiotic from the diseased area.

Oral complications such as glossitis and stomatitis resulting from the use of penicillin aerosol occurred in roughly 5 per cent of the cases in the series here reviewed. The frequency of these complications was found to be less if an antihistaminic solution (Benadryl® or Pyribenzamine®) was added to the aerosol.

It must be emphasized that aerosol therapy is not an office procedure. For good results, inhalations must be taken at least four or five times a day for several days. Hence, it is a home or hospital procedure. Generally poor results of sporadic use of aerosol treatment in the office have discouraged many physicians. In addition, a suitable nebulizer* must be used, one that provides an aerosol composed of particles 5 microns in diameter or less.[5] Larger droplets stop on the walls of the upper respiratory passages and are not carried into the smaller ramifications of the tracheobronchial tree. Attention to details and careful instructions to patients are essential for the attainment of good results. The excellent benefits obtained, particularly in stubborn protracted tracheobronchitis, in bronchiectasis and in infective asthma, more than justify the use of inhalational therapy.

*Vaponefrin® or Asthmanephrin® are the best, in the authors' experience.

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The Preoperative and Postoperative Care of Acute Arterial Obstruction

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SUMMARY

Acute arterial obstruction may result not only from arterial injuries but also from thrombosis or embolism. The fate of the extremity is generally decided in the first few hours following the obstruction of the major artery. It is therefore essential that physicians should be able to recognize acute ischemia of the extremities and institute treatment which will prevent permanent damage and facilitate the reestablishment of normal circulation.

Direct application of heat should be scrupulously avoided since the reduced blood flow is unable to supply increased metabolic demand. The extremity should be placed at or just below heart level so as to avoid both the ischemia of elevation and the edema of dependency. Pressure in the form of either encircling plaster or even compression bandages should be avoided and the extremity simply immobilized by a posterior splint. General supportive treatment is essential to maintain adequate pressure and composition of the arterial blood. In selected cases, agents to overcome vascular spasm or to prevent extension of intravascular thrombosis are indicated.

ACUTE obstruction of a major artery to an extremity is an emergency, both medical and surgical, since the fate of the extremity is generally sealed within the first six hours after the occlusion. By the end of that time, if the ischemia has been sufficiently severe, irreparable damage has been done to the nerves and muscles. In addition, intravascular thrombosis may spread both proximally and distally so as to shut off the collateral circulation and lead to still greater tissue ischemia.

Early recognition of acute arterial obstruction is therefore mandatory, and it may be well first to consider the possible causes of this condition.

ETIOLOGY

Acute thrombosis of a major artery is the most frequent cause of acute arterial obstruction. This thrombosis may be on the basis of atherosclerosis or of inflammatory arteritis such as, for example, that seen in Buerger's disease. The possibility of acute arterial embolism should be considered, especially in a patient who has auricular fibrillation with or without mitral stenosis or a recent coronary occlusion with myocardial infarction. In certain cases of acute arterial obstruction it is not possible to make the differentiation between thrombosis and embolism, but generally patients with acute thrombosis of a major artery will give a history indicative of some form of arterial insufficiency in the extremities before the acute episode. Certain types of arterial embolism such as that from tumor tissue or the paradoxical embolus from venous thrombosis are so rare that detailed discussion of them is not warranted in a communication such as this.

In addition to the more obvious causes, acute arterial injuries may occur as a result of deliberate procedure or by accident during the course of surgical operations. It is well to keep in mind also that the artery itself does not necessarily have to be injured to produce acute arterial obstruction. It may be compressed. Such compression occasionally occurs as the result of a fracture or a dislocation and may even result from a hematoma or from bleeding which takes place within an enclosed space. The subfascial hematoma which develops in either the upper or lower extremity with resultant tissue ischemia is an example of this form of compression.

Spasm of the artery, the so-called local segmental arterial spasm, as Kinmonth, Simeone and Perlow have shown, is probably due to a stretching of vascular (either artery or vein) smooth muscle. This condition may occur as a sequel to trauma, or spontaneously as a result of development of acute venous thrombosis or the lodging of an arterial embolus. Local arterial spasm is apparently myogenic in character and does not respond to interruption of sympathetic ganglia or in the perivascular nerve plexus.

SIGNS AND SYMPTOMS

Early recognition of acute arterial obstruction depends upon alertness to the signs and symptoms of the condition. Generally the first symptom of which the patient complains is numbness of the extremity, with pain, frequently excruciating, following. Weakness is noted, with paralysis developing if the ischemia is severe. When the extremity is observed it is generally pallid and, especially in the early stages, may have a waxy appearance. This blanching is succeeded by mottling with areas of cyanosis contrasting sharply with the general background of pallor. In the late stages cyanosis develops and ultimately there is complete stasis of blood

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in the smaller vessels. In the last stage the skin takes on a peculiar reddish appearance, but by that time it is clear that all hope for survival of the extremity is lost.

Skin temperature changes may best be noted by contact with the dorsum of the examiner's hand, comparing the two extremities preferably at a room temperature of approximately 75° F. It is important especially to note the level on the two extremities at which there is a sudden gradient of skin temperature. The level of adequate cutaneous blood flow is generally considerably distal to the point of obstruction of the main artery. For example, with occlusion of the superficial femoral artery the point at which difference in skin temperature is noted is generally just below the knee, while with obstruction of the popliteal artery, the surface of the leg is usually warm to just above the ankle.

Palpation of the muscles of the extremity frequently is of help in the diagnosis of acute arterial obstruction. Early in this condition the muscles feel doughy. At a later stage the muscles will become infiltrated and hard, finally developing the wooden character noted in Volkmann's ischemic contracture. At this stage irreparable damage has been done to some if not all of the muscle fibers, since this condition is in reality simply rigor mortis.

PROGNOSIS

The nerves to the extremity are the first tissues to be affected by lack of oxygen, and they therefore furnish the most delicate indicator of the degree of ischemia. By noting the level of cutaneous anesthesia and the extent of muscle paralysis or weakness, the severity of ischemia due to acute arterial obstruction may readily be followed. It is particularly useful to mark on the skin with ink the level of cutaneous anesthesia, since frequently the prognosis and therefore the choice of treatment will be determined by the hourly changes in the level of cutaneous anesthesia.

TREATMENT

The immediate treatment of acute arterial obstruction is guided by the well-known dictum, do no harm. Do not apply heat, do not apply pressure, do not elevate.

The local application of heat increases the metabolic demands of the tissues. In the presence of acute arterial obstruction, since the quantity of blood which can reach the part is mechanically limited, the application of heat locally serves only to increase the discrepancy between the needs of the tissues and the supply of blood available to meet those needs. Application of extreme cold should also be avoided, since the tissues are injured thereby. The authors have never seen an extremity saved which was packed in ice in the treatment of acute arterial obstruction. It is advisable to maintain the extremity at a room temperature of 75° F. or below or possibly even to apply cold, wet towels, but this is only of use as emergency treatment until the mechanical obstruction has been relieved or until collateral circulation has taken over the function of the obstructed vessel.

Avoidance of pressure is essential in the treatment of acute arterial obstruction. Not only should pressure from encasing plaster or circular bandages be avoided, but also the pressure upon bony parts caused by the weight of the extremity itself. Pressure over the heel and the lateral malleolus should be prevented by supporting the lower leg on a pillow or soft, rolled-up blanket. The extremity should be placed in a position of relaxation with partial flexion at the joints. If immobilization is required because of soft tissue injury or fracture, it should be achieved without the use of external pressure. A posterior plaster splint, a pillow, or even skeletal traction is to be preferred to any form of treatment which exerts pressure upon the tissues. In the presence of acute arterial obstruction, the pressure in the smaller blood vessels is already low. Complete ischemia may be produced by even the mildest compression.

Since the pressure in the smaller blood vessels is already low, elevation of the extremity above the level of the heart will only serve to exaggerate the ischemia. On the other hand, dependency may produce edema with consequent increase in tissue pressure and obstruction of collateral blood flow. It has been repeatedly emphasized that the optimum position of the extremity is at or just below the heart level.

Concern for the extremity should not be so great that the general condition of the patient is overlooked, for the condition of the patient will have much to do with the ultimate fate of the extremity. The collateral blood vessels, upon which the survival of the extremity depends in the first few hours after acute arterial obstruction, are under vasomotor control, and the character of the blood within them is of importance. Shock must be treated not only because of the low blood pressure associated with this condition but also in order to relax the blood vessels and permit an adequate volume of blood to flow to the tissues. Replacement of lost blood by transfusion is indicated not only for the treatment of shock but in order to maintain adequate oxygen-carrying capacity. The administration of oxygen may be necessary to overcome anoxemia which may be the result of conditions other than those producing the acute arterial obstruction.

SYMPATHETIC NERVOUS SYSTEM

At the risk of being considered categorical, the authors believe that sympathectomy is contraindicated in the emergency treatment of acute arterial obstruction. The advantages to be gained from permanent interruption of the vasoconstrictor pathways may often be counterbalanced by the harmful effects of the trauma of the operation itself. Temporary blocking of the sympathetic nerves by single or repeated injections of procaine or other agents into the region of the sympathetic ganglia may be of help if such injections can be performed without too much trauma either to the patient or to the

extremity. It should be remembered that a decrease in blood pressure produced by thoracic or lumbar paravertebral injections may offset any advantage to be gained from the vasodilatation achieved by this procedure.

VASODILATORS

The place of vasodilators in the treatment of acute arterial obstruction has not yet been clarified. In general it is the belief of the authors that these chemicals are probably of no use and may actually do harm since the blood vessels throughout the body are affected, and unless there is a proportionate increase in the cardiac output, the blood flow will be increased in the region supplied by normal vessels to a greater extent than it will be to the tissues of the extremity supplied by the artery which has been obstructed. It is of importance, however, to inhibit vasoconstrictor tone; but this inhibition can be achieved with more benefit by general treatment of the patient. There are certain stimuli which are known to cause vasoconstriction: Cold, pain, fear, low blood pressure, anoxemia. It is these stimuli which should first be removed. Relief of pain is essential, and the administration of morphine or some similar medication is probably of help in opening up the collateral circulation. The effect of papaverine probably derives more from relief of pain than from any specific action on vasospasm. The authors consider the ingestion of alcohol in a palatable form a specific remedy for vasospasm. This treatment should be repeated as often as appears necessary.

ANTICOAGULANTS

In the presence of acute arterial obstruction, anticoagulants may play an important role in the prevention of further extension of intravascular thrombosis. In the presence of mechanical obstruction of the vessel, however, anticoagulants should be used, in the authors' opinion, only if operation is contraindicated either by the character of the obstruction or by the condition of the patient.

INDICATIONS FOR IMMEDIATE OPERATION

The first thing to be considered when operative intervention is contemplated is the general condition of the patient. The life of the patient takes precedence over the saving of the extremity. Operation should be performed only if there are reasonable grounds for considering that the obstruction is mechanical in nature, that it can be relieved, and that less harm than good will be achieved both in relation to immediate and ultimate prognosis in the individual case. An urgent indication for immediate operative intervention is evidence of increasing ischemia of nerve and muscle. The ultimate fate of the extremity must also be taken into consideration. A good recovery of function at the earliest possible time is the goal, and it is the responsibility of the physician to do all in his power to achieve this objective.

POSTOPERATIVE CARE

The general principles emphasized in the consideration of the immediate treatment of acute arterial obstruction can serve as a guide for treatment in the postoperative period.

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Relation of the Adrenal Cortex to Immunizing Mechanisms

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SUMMARY

Experimental evidence is available to support the general conclusion that pituitary-adrenocortical secretion may have an important regulatory role in immunizing mechanisms, including antigen-antibody relationships and the state of tonus of the ground substance of the mesenchyme. The specific contributions of other processes affected by pituitary-adrenocortical secretion to immunizing mechanisms remain to be elucidated.

THE object of this paper is to present experimental evidence for the role of the adrenal glands in immunizing mechanisms. The term "immunizing mechanisms" is used broadly to include processes concerned with both natural and acquired resistance contributing to the defense of the organism, particularly against intoxications, infectious diseases, and environmental stresses. Immunity may connote increased resistance to both non-antigenic and antigenic substances, although antibody responses to specific antigens will be presented to illustrate in part the relation of the adrenal cortex to immunity.

The relation of the adrenal glands to the defense mechanisms of the body, particularly against intoxications, infectious diseases and environmental stresses of the type of anoxia and abnormal temperatures, has been established generally from both morphological and physiological studies. Moreover, pathologists have long suspected the active participation of the adrenal cortex in these circumstances. Hyperemia, edema, hemorrhage, and focal necrosis occur in the adrenal glands following burns, food or chemical poisoning, and acute infections. Conversely, adrenalectomized animals and patients with Addison's disease are exceedingly sensitive to drugs, toxins, and stresses in amounts and degree generally innocuous to the normal individual. The established sensitivity of adrenalectomized animals to anesthetics and to surgical trauma is now being appreciated in connection with operative procedures in human subjects.[15]

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A precise description of the role of the adrenal cortex in immunizing mechanisms has been delayed and partially obscured by the numerous immunological studies which have been conducted with the hormone of the adrenal medulla, namely, epinephrine. The basis of this confusion is now apparent as a result of the observation[7] that epinephrine is a powerful augmentor of the rate of secretion of the hormones of the adrenal cortex. The normal mechanism concerned with adrenocortical secretion is based upon the elaboration of the adrenocorticotropic hormone, ACTH, of the anterior pituitary gland. This pituitary hormone is secreted in greater than normal quantity following exposure of the organism to a wide variety of unrelated stimuli: Inanition; alterations in environmental factors, for example, cold, heat, and anoxia; trauma in the form of tissue injury, fractures and hemorrhage; injections of bacterial toxins, toxic chemicals of the type of arsenic or benzene; anesthetics, such as nembutal; foreign proteins, and a variety of substances normally produced in the organism, for example, histamine, epinephrine, thyroxine, and estrogens.[16] The increased release of adrenocortical steroid hormones, as a consequence of any of these stimuli, does not occur in the absence of the pituitary, and each of the stimuli, therefore, has a common physiological basis, that is, its capacity to increase the output of pituitary adrenocorticotropic hormone. Thus, an increased secretion of epinephrine in the normal individual will elevate the rate of release of pituitary ACTH and result in an increased rate of secretion of the hormones of the adrenal cortex. There is, therefore, an intimate physiological relationship between the secretions of the two endocrine glands which constitute the adrenal gland, namely, the adrenal medulla and the adrenal cortex.

From the foregoing, it would appear that any physiological process which contributes to an immunizing mechanism and is influenced or altered specifically by adrenocortical secretion will also be affected by any one of a wide variety of stimuli which augment pituitary-adrenocortical activity. This general body of information will be of considerable aid in explaining the similarity of certain phenomena of immunity under widely diverse circumstances.

Let us turn now to the question of what pituitary-adrenocortical stimulation, and the consequent increase in circulating adrenocortical steroid hormones, might contribute to immunizing mechanisms. The answer to this question can be derived in part from the established physiological functions of these steroid hormones. In addition to the capacity of the

adrenocortical steroids to alter water, salt, protein, carbohydrate, and lipid metabolism, it has been demonstrated recently that these hormones contribute to certain aspects of immunizing cellular responses, including the development of phagocytic cells, the production of immune globulin, and an increased resistance of tissues to the penetration of foreign substances. Although it is not established clearly that the known physiological effects of pituitary-adrenocortical secretion can explain completely the role of this endocrine mechanism in immunizing reactions, the available evidence does afford a basis for both the present discussion and future investigation.

Of the cells concerned with immunizing mechanisms, the role of reticuloendothelial cells has been known since the fundamental observations of Metchnikoff,[8] initiated in the latter part of the last century. Metchnikoff's classical studies demonstrated clearly the significance of the macrophage and of phagocytosis in immunizing mechanisms contributing to general resistance. The function of the macrophage in immunizing mechanisms appeared to be dependent upon the phagocytic capacity of the cell, which in turn is apparently of importance in the possible role of these cells in the formation of antibodies. This was true not only in relation to the invasion of the body by infectious organisms but also in relation to the defense against soluble toxins or toxic chemical agents.

Another cell type with an apparent role in immunizing mechanisms is the lymphocyte. This cell, like the macrophage, arises from the reticular structures and participates in chronic inflammatory processes of all types, and accumulates at the site of chronic irritation.

In view of these suggested roles of the macrophage and the lymphocyte in immunizing mechanisms, it is of considerable interest and significance that the adrenocortical steroids have a pronounced effect on these two types of cells and on reticuloendothelial cells in general. Increased numbers of phagocytic cells develop in lymphoid structures as a result of increased adrenocortical steroid secretion or injection.[4] Indeed, the histological picture seen in these circumstances is similar in many respects to that observed following a single injection of a bacterial antigen.[2] This ability of adrenocortical steroids to increase the number of macrophages in tissues is a striking contribution of pituitary-adrenocortical secretion to immunizing mechanisms. The physiological importance of this has been illustrated by the observations of Reiss and Gothe,[13] and, more recently, of Gordon and Katch.[5] Both of these groups of investigators have shown that the capacity of the reticuloendothelial system to remove soluble or particulate material from the circulation can be augmented as a result of increased pituitary-adrenocortical activity.

The structure, and therefore presumably the function, of the lymphocyte is also notably affected by adrenocortical steroids. Lymphocyte dissolution and degeneration, with a resultant decrease or involution of lymphoid tissue, is a well-known phenomenon occurring following a wide variety of stresses. These alterations in lymphocyte structure and numbers can be produced[4] either with pituitary ACTH or by the administration of adrenocortical steroids, oxygenated in position 11 of the steroid nucleus. It is of some interest, particularly in view of current interest in the therapeutic use of adrenocortical steroids, that desoxycorticosterone acetate, in the doses employed, does not affect lymphoid tissue structure or function. It seems clearly indicated, moreover, that in most instances the wide variety of stresses which cause augmented tissue involution have their physiological basis on the effect of this stress in augmenting the rate of pituitary-adrenocortical secretion. Indeed, it may be pointed out that there are at present only a very few agents which are known to cause alterations in lymphoid tissue size and function in the absence of the adrenal glands. These agents are: X-radiation, the nitrogen mustards, urethane, and large doses of estrogens.[20]

As to the contribution of the lymphocyte to immunizing mechanisms, it has been demonstrated that in the immunized animal one of the constituents of lymphocytes is antibody globulin.[3, 6, 9] In the normal as well as in the immunized animal, the shedding of lymphocyte cytoplasm and lymphocyte dissolution may be accelerated as a consequence of increased pituitary-adrenocortical secretion, and the constituents of this cell may thus be released to the lymph and eventually participate in metabolic transformations.[19, 21] Therefore, the normal physiological functioning of the lymphocyte may be accelerated by the administration of adrenocortical steroids or as a result of the release in the organism of excessive amounts of pituitary ACTH following any one of the wide variety of stimuli which have been mentioned previously. This is seen, for example, in the fact that the injection of adrenocortical steroids, or increased secretion of these hormones as a result of pituitary adrenocorticotropic hormone injection, causes an elevation of antibody titer, either in a hyperimmunized animal or in a previously immunized animal with little circulating antibody.[19, 21] These experiments suggest that the physiological basis of the anamnestic response is the pituitary-adrenocortical control of lymphocyte structure and function. This would afford an explanation for the anamnestic response which is produced by a wide variety of unrelated stimuli.[1]

These results with antibody production in the intact animal have been extended recently to an examination of the role of the adrenal cortex in the production of tissue antibodies *in vitro*. This approach was suggested for two reasons. First, in studying isolated tissues, the variables affecting the concentration of antibody in the circulation at a particular time would be largely eliminated. Second, the relation of the inflammatory reaction to local tissue antibody production warranted detailed study of the process.

The experimental procedure developed for studying antibody production *in vitro* by isolated tissues

is as follows: Tissues taken from previously immunized animals are minced and immediately incubated under physiological conditions in non-immune homologous serum. The antibody released by the tissue to the serum can be titrated, as can the antibody in the tissue prior to, and at the end of, the incubation period. This recent work[14] suggests that the actual site of antibody production may vary with the mode of immunization employed. When rats or mice are immunized with a single intravenous dose of sheep erythrocytes, the spleen appears to be the most active source of antibody. On the other hand, when the antigen is given in periodic intraperitoneal injections and various tissues taken from the rats at the height of antibody production, the most active release of antibody *in vitro* is observed in incubates of mesenteric lymph nodes. This technique has now been extended to study[18] the effect of the adrenal cortex on tissue antibody production. When a comparison is made of the *in vitro* production of hemolysins against sheep erythrocytes by splenic mince obtained from adrenalectomized and control rats injected intravenously five days earlier with a single dose of sheep red blood cells, it is seen that there is no indication of new formation of antibody in splenic tissue from immunized adrenalectomized rats. However, under the same conditions, tissues of immunized animals that have not been adrenalectomized show a continuing production of antibody during the incubation. In further experiments, it has been demonstrated that tissues from immunized animals, previously injected with adrenocortical hormone, show a degree of antibody production *in vitro* which exceeds that of non-hormone-treated immunized animals.

The question arises whether antigen-antibody reactions in tissues are limited to those tissues in which actual synthesis of antibody occurs. This would not seem likely, in view of extensive experience in the field of passive sensitization. This suggests a rather general capacity of tissues for antibody uptake, and was confirmed experimentally[14] by the simple procedure of incubating tissues from non-immunized rats with antibody-containing serum from immunized rats. In all instances the antibody content of the serum medium decreased, and antibody was apparently taken up by all tissues studied. The influence of the adrenal cortex on this process remains to be investigated and will be of interest in relation to a possible role of the adrenal glands in passive sensitization and immunity.

It is clear, therefore, that the adrenal cortex plays the following roles in influencing immunizing mechanisms: (1) The level of secretory activity of the adrenal cortex is influenced by the administration of an antigen, since antigens may augment, in a non-specific manner, pituitary-adrenocortical secretion. (2) An increased level of circulating adrenocortical steroids has a profound effect on cells of the reticuloendothelial system, namely, macrophages and lymphocytes, which are possibly concerned with the processes of antibody formation and release. (3) The rate of formation of antibodies by specific tissues is considerably influenced by adrenocortical secretion.

Recent observations have revealed yet another role of the adrenal glands in immunizing mechanisms. This role is concerned specifically with the phenomenon of tissue permeability. It has been demonstrated[10, 11] that the intradermal spreading of India ink, mixed with either saline or testicular hyaluronidase (spreading factor), is inhibited by adrenocortical extract. This inhibition is produced when the extract is administered either intraperitoneally or intradermally at the site of India ink injection. When administered locally, the greatest effect of adrenocortical extract is obtained when it is given simultaneously with the India ink. On the other hand, adrenalectomy resulted in pronounced enhancement of the spreading reaction. Of interest in this connection is the recent demonstration[17] that pituitary-adrenocortical hormones inhibit the Shwartzman phenomenon. It seems clear that adrenocortical function may play a profound role in resistance against invasions of the organism by toxic substances or organisms. It would appear that the adrenal glands are concerned in the maintenance of the tonus of the ground substance of the mesenchyme. This may be of significance in relation to certain of those clinical circumstances which appear to be ameliorated following ACTH or cortisone therapy.

In a discussion of the role of the adrenal glands in immunizing mechanisms, reference should be made to the hypersensitive state. This appears to be indicated particularly in view of the remarkable reports which are becoming available of the therapeutic effects of adrenocorticotropic hormone and potent adrenocortical steroids in diseases in which hypersensitivity may be an etiologic factor. The direct relationship of the adrenal cortex to one manifestation of the hypersensitive state, namely, anaphylaxis, has been established clearly. Normal mice and rats, which are exceedingly resistant to the induction of the anaphylaxis phenomenon, become highly susceptible following adrenalectomy.[12] The basis of the role of the adrenal cortex in the prevention of anaphylaxis is not yet clear. Elucidation of this mechanism will undoubtedly contribute to an understanding of the role of the adrenal cortex in the hypersensitive state in general.

A few comments should also be made in relation to the effect of pituitary-adrenocortical secretion in causing disappearance of blood eosinophils. In view of the eosinophilia in certain allergic states, and the eosinophilic infiltration into subcutaneous connective tissue, which occurs as a result of inflammation, it is of considerable interest that augmented pituitary-adrenocortical secretion results in pronounced diminution in the level of circulating blood eosinophils. The basis of this eosinopenia is still unexplained; it is not known whether it is due to a failure of production of these cells, to an increased rate of their removal by the tissues, or to an increased destruction of eosinophils. If it should be

observed that there is an increased infiltration of eosinophils into the connective tissues as a result of adrenocortical extract administration, as occurs during the acute inflammatory response, there would be established a connecting link between adrenal secretions and the allergic type of inflammatory reaction. However, there yet remains unexplained the nature of the mechanisms by which adrenocortical steroids ameliorate the hypersensitive state. Perhaps several speculations may be permitted at present, with the purpose chiefly of indicating possible further lines of investigation in this fundamentally important field. It would appear logical to suggest that pituitary-adrenocortical secretion may affect the antigen-antibody reaction, which is a preliminary to allergic inflammation; this action of the hormonal mechanism may be based on one or more of at least three processes: (1) An alteration in the relative concentrations of antigen and antibody in tissues, thus affecting their rate of interaction; (2) an alteration in tissue factors influencing the extent of combination of antigen and antibody, and (3) an alteration in the degree of production of tissue inflammatory substances released as a result of antigen-antibody reaction. It would at the moment seem paradoxical that the inflammatory response resulting from antigen-antibody reaction may be blocked by adrenocortical steroids, which also augment production of tissue antibody. This may indicate that the adrenocortical steroids are concerned with the inflammatory response in some manner other than that relating to the reaction of antigen with antibody. This consideration appears to favor at present the working hypothesis that the adrenocortical steroids block the tissue production of substances which are deleterious to cells and cause cellular injury, thus ameliorating the hypersensitive state.

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Care of the Neglected Burn Patient

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SUMMARY

In spite of widely dispersed modern knowledge of burn treatment, neglect or inept care of severely burned patients continues as a cause of a considerable medical problem. Since the neglected patient is usually emaciated, pain-ridden and low in morale, prompt attention to rehabilitation through blood transfusions, nourishment, relief of pain and cleansing of the wound is mandatory. Skin grafting as soon as possible is the aim.

PATIENTS who have been burned many months or even years before and are still unhealed are observed in the everyday practice of reconstructive surgery. Such patients are usually in an extremely debilitated condition and desperately ill. Heroic effort is necessary to help them to survive at all. Primary care of them may require several months and late reconstructive operations may extend over a period of years.

In many cases, the patient himself is responsible for the neglect of even severe burns. Religious fanaticism, ignorance, or a generally uncooperative attitude may have caused him to shun treatment. Also, feeble-minded, epileptic or insane persons may be burned severely yet not seek medical care.

All too often, however, errors on the part of physicians and nurses have created the gross physiological catastrophe which occurs with neglect of a severe burn. The commonest errors responsible for the condition of the patient include, from a general standpoint, a complete lack of understanding of the metabolism of patients with burns, the withholding of proper fluids and blood transfusions, neglect of diet and often the misuse or withholding of the various chemotherapeutic and antibiotic agents. The physician may be so hurried that he relegates the time-consuming dressings to the less experienced interns and residents or to nurses, orderlies and aides. In addition, because of the extremely high cost of care of a serious burn, all but the wealthiest patients are channeled to the larger wards where adequate care may be much more difficult.

Nursing errors and neglect are common. The patient who is weak and debilitated and scarcely able to feed himself, or the patient with severely burned hands, for example, may be denied proper nourishment because no one will take the time necessary to see that he gets an adequate diet. In addition to this, an extremely burned patient presents a difficult problem in morale. Because his dressings are malodorous and he cries and screams with pain when attempt is made to help him, he may be quickly classified by the attending nurses and doctors as "difficult" or "impossible," and neglect may ensue. Special nurses often refuse to attend patients with burns, thereby handicapping the physician, the patient and the nurses on general duty.

Ineptitude in the local care of the burned area is often responsible for the extremely poor morale of the patient and for much of the difficulty in taking care of him. The commonest error is the use of coarse-mesh gauze next to the granulating surfaces. This practice, which has been universally condemned by those caring for large numbers of patients with burns, results in the budding of granulations through the meshes of the dressings. Since removal of this gauze causes pain, bleeding and destruction of new epithelium, dressings are made less frequently than is desirable. Granulations then grow farther into the gauze. It is not uncommon to encounter patients who have been given general anesthesia every third or fourth day over a period of many weeks for change of dressings. The odor and general surgical uncleanliness of soiled dressings is offensive to the patient and results in decreased appetite. Irrigation of the dressings with saline, boric or mild Dakin's solution through catheters in the dressings does not compensate for needed change of dressings.

The local application of various burn dressings, oils, pastes, powders and other "cure-all" preparations has been advocated continuously since the time of Hippocrates. The very number of such therapeutic agents indicates that none of them has really settled the problem; one must turn, as always, to the basic physiological surgical principles of the care of any open wound.

Poor dressing technique is the rule rather than the exception in the care of extensive burns. Continual contamination and reinfection from the fingers and nose and throat of those who change or observe the dressings is all too frequent and a factor which considerably prolongs morbidity. In critical cases, such added infection may cause death.

The results of skin-grafts attempted by surgeons without particular training for the operation vary greatly in the degree of success. The commonest errors here are poor choice in type of skin-graft used and poor judgment in the amount of skin taken or in choosing the bed on which to apply the graft. The intact skin on a seriously burned patient is a very precious commodity upon which future function and even life itself will probably depend. To scar such an area and render it unfit for further use by such a crude method as "pinch-grafting" is certainly to be profoundly condemned (Figure 1).

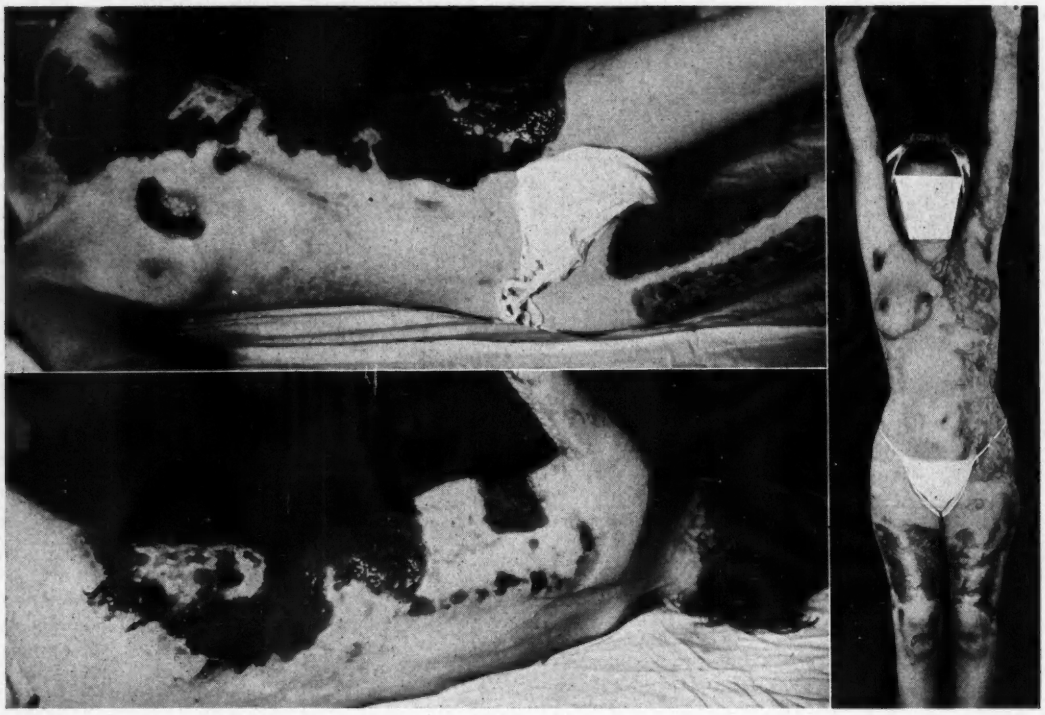

Figure 1.—*Upper left:* Burn occurred seven months before picture was taken. Destruction on thighs from too deep graft removal. Flank scarred by inept pinch-grafts and rendered unfit for future donor site. *Lower left:* Posterior view same patient. Note decubitus ulcers and wasting. *Right:* Same patient one year later. "Patch-grafts" were lifesaving in this instance.

Likewise, it is poor judgment to use the dermatome to take too many large sheets of skin and thus open an additional large surface area to bacterial contamination, oozing and drainage on a person who has already lost a considerable area of skin. This overzealous treatment may tip the scales unfavorably in the direction of failure and catastrophe. The risk of loss of such large sheets of skin, when applied as a continuous sheet on a dirty granulating surface, is considerable. If loss occurs it is tragic, for there may be no further chance to cover the burned areas with skin. When the burned area is relatively small, involving, say, one extremity or a large area on a flank, it is certainly desirable to cover the granulating surface with continuous sheets of skin. This practice by one familiar with the technique, who places the skin on a bed which is ready to receive it, results in the most prompt healing known for burns. On more extensive burns, however, it would be foolhardy to try to cover completely the granulating surfaces with continuous sheets of skin, since the amount of donor skin necessary might be so great as to be incompatible with survival (Figure 2). In such cases, the cutting of the thick-split sheet of skin-graft into smaller pieces and applying them in the "flag-stone" manner (Figures 1, 2 and 3) results in rapid clean-up of the infected areas. This plugs the life-sapping leak of important serum and plasma.

Indiscriminate use of the dermatome in inexperienced hands can have tragic results. On many patients, particularly children whose skin is thin, a graft is often taken so thick that there is no hope that re-epithelialization and healing can take place in the donor site (Figure 1). Thus, the already seriously burned patient has an additional area of third degree loss of skin.

CLINICAL CHARACTERISTICS

Fetor, the gauntness associated with chronic debilitating disease, stiffness of the joints, poor morale, fever, anemia and anorexia—these are clinical conditions typical of the patient with neglected severe burns. Such a patient may cry out if a gesture is made toward the burned area. Available donor sites for skin are usually exceedingly scanty due to the wasting of the skin and subcutaneous tissues and often to previous ill-fated skin-grafting. Contractures may have caused ectropion, elevated alae of the nose, chondritis and crumpling of the ears, and contractures about the lips and around the joints of the extremities. These contractures limit movement. Decubitus ulcers are exceedingly common. Granulations are usually pale and often dirty and boggy. Superficial venous thromboses are not uncommon in the extremities, with edema of hands and feet due to faulty venous and lymphatic return flow and to hypoproteinemia.

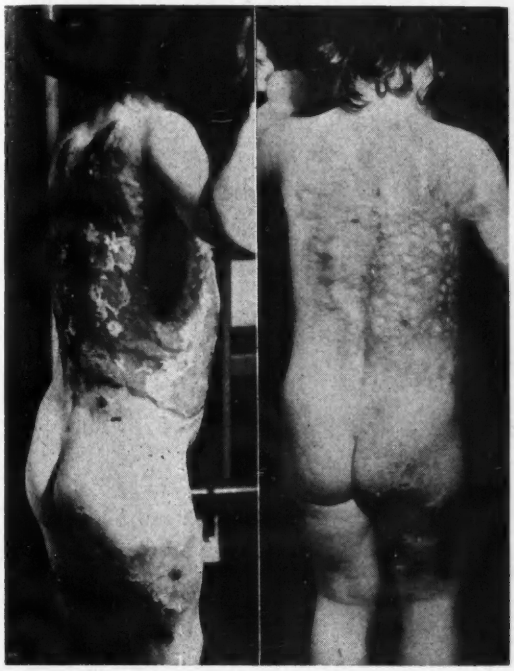

Figure 2.—*Left:* Flank and thigh severely burned four months before this picture. Donor areas very scarce. *Right:* Two months and 24 days later. Entirely healed by "patch-grafting." Later release of scar and recovering of areas can be performed with continuous sheets of skin on a sterile recipient area and on a well patient instead of a debilitated one.

Such patients are often already addicted to morphine. Their appetite is exceedingly poor and they have lost the will to live. They continually find fault with everything around them. They have usually found a position in which they are the least uncomfortable and they stick fanatically to this one position, trying not to move for fear of hurting themselves. Laboratory studies show extreme degrees of anemia and hypoproteinemia. Although blood levels of vitamins and of hormones are not ordinarily measured, levels undoubtedly would be found to be greatly below normal values.

TREATMENT

The general care of patients with neglected burns can be summarized as providing adequate nutrition and good morale. If nutrition is adequate, good morale normally follows. Transfusion with rather large amounts of whole blood has been found to be the most effective single method for restoration. An initial transfusion of 1,000 cc. of whole citrated blood in an adult is usually followed by daily transfusions of 500 cc. until the patient is ready for skin-grafting ten days to two weeks after the time of first examination. As skin-grafting is completed and the open surface areas diminish, the amount of blood is correspondingly diminished but is kept up so that a sustained high level of blood proteins and of hemoglobin is maintained. In addition, of course, the antibodies and other factors carried in the donor blood are of value to the patient. In a recent case, 55 consecutive blood transfusions were necessary before grafting was completed and the patient restored to a completely epithelialized and balanced state. The patient had appeared moribund when first observed.

As blood transfusions are only a crutch to be used until the body can again supply its own proteins and hemoglobin, adequate diet is a major factor in restoration. A diet high in proteins, vitamins and calories (4,000 to 4,500 daily) is essential. If appetite lags so that adequate dietary intake is impossible, gavage may be necessary. Dietary stimulants are of considerable help but they are of little value until the patient has been given enough blood by transfusion to permit a beginning of return to normal processes. Large doses of vitamins will do more than any other one factor to stimulate appetite, but the use of alcoholic beverages should not be overlooked. Beer, ale, stout, cocktails and highballs all have their place in stimulating appetite. Beer is used with great success in children, who rapidly learn to like its flavor. Having a bottle of beer before lunch and before dinner will often stimulate them to eat a good meal. Although a great deal of work has been done on the use of artificial proteins (amino-acids) intravenously, there is no substitute for the autogenic manufacture of proteins and amino-acids by the body itself through the alimentary tract. All dietary supplements can and should be used, however, until normal consumption of food is resumed.

Dressings on the burned areas must be soothing and must be such as to give egress to the excretory products of the granulating surfaces. At the first dressing, the patient is put into a bathtub, dressings and all, and allowed to soak in normal saline so that the removal of dressings is relatively painless (Figure 3). The use of a gallon of 2 per cent Dakin's solution in such a tubful of water has also been found to be of definite value in hastening the clean-up of granulating surfaces.

Following removal of the dressings in the tub of normal saline, the burned area is redressed with fine-mesh gauze which has been impregnated with a paraffin and vaseline mixture known as "parawax." The mixture is approximately two parts of vaseline to one part of paraffin and is waxy in consistency so that it does not macerate new epithelium. As it does not become oily and soak into the dressings, the surface lubricating effect is not lost as often happens in the case of vaseline gauze.

The patient is kept in bed with parawax gauze dressings in place until the following day. He is then placed in the tub again and while he is there the dressings are removed and fresh dressings applied. In addition, exercise of joints is carried out in the tub, lessening the period of later rehabilitation. Because of the factor of bacterial contaminants in the tub, spikes of fever following the first few days of tubbing are not unusual. The temperature-regulating mechanism of burn patients is considerably

Figure 3.—*Upper left:* Tubbing an extensively burned patient in normal saline. Painless change of dressings with patient in tub greatly aids morale and appetite. *Lower left:* Same patient several weeks after burns have been covered by "patch-graft" technique. *Right:* Six months later. Note excellent nutrition and range of motion of arms and legs.

distorted by destruction of sweat glands over large surfaces of the body and by the presence of large dressings which prevent normal evaporation and cooling. Alcohol rubs, ice compresses to the head, cool water enemas, etc., are indicated if temperature spikes rise too high.

All of the procedures for the local and general care of the severely burned patient are directed toward one point—the application of skin-grafts to the denuded areas as soon as possible. Since thin, wasted extremities and bony trunk areas offer only small amounts of skin for grafting purposes, economy of skin dictates the use of the previously mentioned "patch-grafting" technique if the burn is extensive. Application of continuous sheets of skin is the method of choice for smaller burns.

Improvement in morale and appetite usually follows within a few days of skin-grafting. Additional grafting is carried out as soon as new areas are cleaned up and ready.

In extensive burns where patch-grafting techniques are used, some contractures are inevitable. The release of these contractures represents a much less formidable plastic surgical procedure at a late period when the patient's metabolism is normal and he is once again healthy.

960 East Green Street.

Comparative Concurrent Results of Vagotomy Procedures, Conventional Gastric Resection and Hemigastrectomy with Subtotal Vagotomy

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SUMMARY

The question of the best surgical treatment of duodenal ulcer remains unanswered.

In a series of 132 patients, results following gastric resection and hemigastrectomy with subtotal vagotomy were better than those following vagotomy procedures alone.

INTEREST in the surgical treatment of duodenal ulcer has been stimulated by the recent introduction of vagotomy by Dragstedt[2, 3, 4] and co-workers. This procedure and gastric resection constitute the two currently popular methods of surgical treatment of this lesion. Gastric resection, including removal of at least three-fifths of the stomach and the ulcer-bearing portion of the duodenum, has stood the test of time as well as or better than other surgical procedures heretofore used.

The present study is based upon surgical treatment in 132 cases of duodenal ulcer. The postoperative follow-up period was approximately two years. Three types of operation were used concurrently during the period covered by the study. In 43 cases so-called complete vagotomy was used, with or without supplemental gastroenterostomy; in 47 cases the operation was conventional gastric resection; in 42 the procedure was hemigastrectomy and so-called subtotal vagotomy as recently described by Stevens.[9]

Of the three operative procedures studied in this series, vagotomy is the simplest to perform, but it has certain disadvantages, two of which appear to be of major importance: It attacks the nervous factor and not the hormonal factor apparently involved in the secretion of gastric acid, and impairment of emptying of the stomach occurs in an appreciable percentage of cases.

Gastric resection has had a longer test of time than has vagotomy, but its disadvantages are that it attacks the hormonal factor but not the nervous factor, and that it is a more destructive surgical procedure.

The purpose of hemigastrectomy with subtotal vagotomy, as used in the third group in this study, is to attack both the hormonal and nervous phases of the secretion of gastric acid. At the same time it was hoped that impairment of the emptying of the stomach could be avoided by leaving some vagus fibers intact. The destructiveness of conventional gastric resection is lessened by removing only half of the stomach.

This procedure was carried out with the full realization that the consensus is that partial vagotomy alone is not effective in eradicating duodenal ulcer. However, it was hoped that a combination of these procedures might prove at least as effective as the more radical conventional gastric resection. If this proves to be the case, it would have the advantage of being a less mutilating procedure, and possibly the occasional incidence of weight loss and anemia following the more radical gastric resection would be decreased.

Furthermore, in this connection, Aaron and co-workers,[1] quoting from a panel discussion at a meeting of the American Gastroenterological Association,[13] stated that "the opinion that transthoracic or transabdominal vagotomy as usually performed is seldom complete is concurred in by all modern physiologists," and further that "complete vagotomy in experimental animals regularly causes digestive disturbances severe enough to cause death." Anatomic evidence of vagus fibers traversing the esophageal musculature, of small esophageal plexuses which may readily escape notice, and of ganglionic plexuses within the walls of the stomach is also cited to strengthen the belief that vagotomy as performed clinically is seldom complete.

Technically, subtotal vagotomy, as carried out in the series here reviewed, is simple. The vagus fibers are divided approximately one inch below the gastroesophageal junction on the lesser curvature of the stomach. The division is made after a mass ligation which includes the left gastric artery. Figure 1 is a diagrammatic illustration of photographs of the excellent anatomical dissections made by Dragstedt and co-workers.[5] It shows that practically all fibers of both vagus nerves accumulate between the lesser curvature of the stomach and the left gastric artery before they enter the stomach.

This procedure differs from the partial vagotomy reported by Winkelstein and Berg[12] who used an-

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TABLE 1.

Operation	No. of Cases	Postoperative Clinical Results: Good	Unsatisfactory	Marginal Ulcer	Mortality
1. Vagotomy procedures	43	33 (78%)	10 (22%)	3 (Insulin test negative in 2)	1
2. Conventional resection	47	42 (90%)	5 (10%)	1	0
3. Hemigastrectomy and subtotal vagotomy	42	38 (90%)	4 (10%)	1	0
Total	132				

TABLE 2.—*Gastric Acidity*

Type of Operation	Preoperative: Night Secretion	Histamine	Insulin	Postoperative: Night Secretion	Histamine	Insulin
1. Vagotomy						
a. Alone	700cc./20°	66.6°	83.7°	247cc./10.5°	51°	13°
b. With gastroenterostomy	777cc./37°	52.4°	64°	530cc./2°	45°	13.8°
2. Conventional resection	808cc./29°	60°	62°	400cc./3.5°	18°	14.5°
3. Hemigastrectomy and subtotal vagotomy	746cc./52.5°	65.5°	74°	181cc./5°	25.3°	18.3°

terior (left) vagotomy. So-called "partial vagus resection" has also been attempted by Moore,[8] who divided the left vagus and only the gastric branches of the right vagus nerve. This was unsuccessful in preventing the unfavorable side effects of vagotomy, but Moore concluded that "variations in procedure which may produce protection against ulcer without incurring side effects should be further studied."

RESULTS

Results of the present study are shown in Tables 1, 2 and 3.

COMMENT

Good clinical results following adequate gastric resection alone and following hemigastrectomy with subtotal vagotomy were the same (90 per cent). Good results following vagotomy with or without gastroenterostomy were relatively fewer (78 per cent). This coincides with the report of Walters[11] of good results in 79 per cent of cases following vagotomy procedures.

There were no deaths following gastric resection or hemigastrectomy with subtotal vagotomy. There was one operative fatality (from perforation of the esophagus) following vagotomy.

Stomal ulcers occurred in one patient following gastric resection, in one following hemigastrectomy with subtotal vagotomy, and in three following vagotomy and gastroenterostomy. The stomal ulcer that occurred following gastric resection healed and remained healed six months or more following supradiaphragmatic vagotomy. In the cases in which marginal ulcers developed following vagotomy and gastroenterostomy, the lesions likewise healed and remained well six months or more after operation to destroy the gastroenterostomy and carry out adequate gastric resection.

Griswold[6] suggested preoperative determination as to which patients with duodenal ulcer will respond best to gastric resection and which best to vagotomy. The acidity studies in this series (Table 2) may be helpful in making such a selection.

TABLE 3.—*X-Ray Studies*

Type of Operation	No. Cases Studied	Retention After 6 Hrs.	Per Cent Incidence
1. Vagotomy			
a. Alone	10	7	70%
b. With gastroenterostomy	12	2	17%
	22	9	41%
2. Conventional resection	33	0	0
3. Hemigastrectomy and subtotal vagotomy	38	0	0

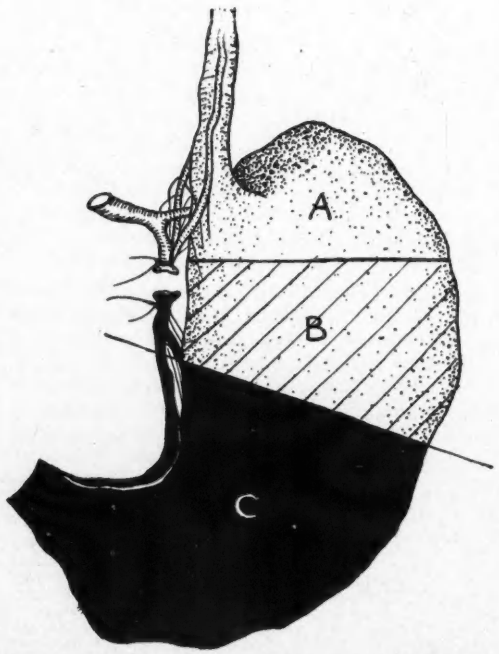

Figure 1.—Division of the accumulation of the fibers of both vagus nerves between the lesser curvature of the stomach and the left gastric artery is shown. A—Vagus nerve fibers intact. B—Denervated portion of remaining stomach after hemigastrectomy. C—Portion of stomach removed.

Histamine-induced secretion of gastric acids is greatly reduced following adequate gastric resection and following hemigastrectomy with partial vagotomy, whereas this effect is relatively minimal following vagotomy.

If this factor alone were considered, an opinion that at least those patients with a high acid secretory response to histamine should be treated by gastrectomy might be warranted. It has been suggested (Stevens and Kipen[10]) that this principle may apply in the selection of patients with post-gastroenterostomy marginal ulcer for surgical treatment, on the basis that in those cases in which there is a high histamine response, the hormonal factor, which is best treated by resection, is predominant.

Data on night secretion and insulin acidity values are not helpful, as the data are essentially the same following vagotomy as they are after resection procedures.

An effort was made to evaluate the influence of the alkaline duodenal content in gastrectomized patients in order to account for the similarity of insulin test results in gastrectomized patients to the results in vagotomized patients. Some gross studies were made to determine the bile content of the stomach following gastrectomy. The results were not consistent since the hydrochloric acid figures following insulin hypoglycemia were, on the whole, as low when no bile was found in the gastric contents as when bile was present.

Identical studies of gastric retention were made approximately two years following the three types of operations. The same measured amount of barium that was ingested preoperatively was used for x-ray studies included in this report. In patients who had undergone gastric resection and hemigastrectomy and in those who had had partial vagotomy there was no instance of retention. Seventy per cent of patients who had had vagotomy alone had six- to 24-hour retention. The incidence of retention after gastroenterostomy and vagotomy was 17 per cent.

The incidence of retention two years following vagotomy procedures is somewhat less than that reported for the same series (Kipen and Stevens[7]) one year after vagotomy. The reason for this is not clear. It might be postulated that some compensation occurs, as time progresses, through vagus fibers remaining in the esophageal wall and in esophageal plexuses which escaped detection when vagotomy was done.

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Indications for Different Approaches to Prostatectomy

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SUMMARY

Most urologists are definite and positive in their conviction as to which approach to prostatectomy is indicated in a given case. Their views are often so widely divergent that other physicians may be confused as to the best advice to give patients who need prostatic operation. Urologists who extol one approach or technique and deride another only add to the confusion and prejudice.

The most important indication for the use of any approach or technique is the ability of the surgeon to carry it out.

MUCH has been written and said about the advantages and also the dangers of the different approaches to prostatectomy. The stated indications for the use of the suprapubic, the transurethral, or the perineal approach, with modifications of each, vary widely among different surgeons. Undoubtedly this has resulted in confusion in the minds of many physicians who are not urologists. The referring physician may not be sure as to which operation he should advise the patient to have, or the patient himself may have decided upon an approach which is not applicable in his case or which the surgeon who is to operate is not prepared to carry out.

Most urologists, however, are agreed upon the following few points: (1) The classical suprapubic approach is the easiest to learn and to perform. (2) The transurethral is the most difficult to learn and to perform correctly. (3) The perineal results in sexual impotence more frequently than does either of the other two approaches. (4) In most cases of median bar, bladder neck contracture and prostatic carcinoma which are obstructing urinary outflow, the transurethral approach should be used if the surgeon has had training in this method. (5) Removal of a greatly enlarged prostate gland, a relatively rare condition, should not be attempted transurethrally.

Some of the more commonly proclaimed indications for the different methods are: (1) If there is intravesical enlargement, the suprapubic approach should be used. (2) In cases of intra-urethral hypertrophy, the perineal approach is more suitable. (3) For removal of small glands, the endoscopic route is best. These indications might be acceptable to the surgeon who is as competent in one method as in another. Every well trained urologist should be familiar with the different techniques and be able to employ at least one technique of each approach. However, even though he does use all three approaches in accord with his beliefs as to indications for them, the surgeon undoubtedly has had more training and experience in, and is himself better adapted to carry out, one procedure than the others.

Some of the more controversial advantages of each approach and technique, as proclaimed by the enthusiast, are that the operation of his choice (1) results in less shock, less hemorrhage and fewer immediate complications than the others, (2) permits of a more complete removal of the gland, (3) requires shorter hospitalization, (4) is followed by less infection and less postoperative morbidity, and (5) gives final results that are better with a lower incidence of recurrence of obstruction. When a surgeon claims these advantages for the method he uses, it is undoubtedly true that when he performs the operation by the method of his choice he obtains better results by that method than he does by using a different approach. But another surgeon, equally skillful, experienced and honest, may claim the same advantages for quite another method and technique.

It has been repeatedly stated that the surgeon should fit his method of approach to the type of bladder neck obstruction his patient has. This dictum, however, is applicable only to a limited extent, for the indications followed by one surgeon for the use of a certain approach might be entirely different from those followed by others of different training, experience, ability, and temperament. Therefore, the most important indication for any method or technique of prostatectomy is the experience and ability of the surgeon who is to perform the operation, and he himself knows these better than anyone else.

The excessive praise of one approach to prostatectomy and condemnation of a different procedure causes other physicians, and also sometimes patients, to become prejudiced against one or more methods or techniques. It is difficult for the operating surgeon to exercise his best judgment in deciding upon which approach to use in a given case, when pressure for one method over another is exerted by the referring physician or by the patient.

All approaches to prostatectomy and most of the variations of technique of each, when performed correctly, are good and lead to successful end results in the majority of cases. Conversely, when the operation is incorrectly performed, no matter what method is used, immediate complications occur more frequently, the morbidity is greater, and the end results poorer. Every surgeon knows or should know which operation is indicated for him to do in a given case. Having the best interest of his patient at heart, and not allowing himself to be unduly influenced by the referring physician or by the patient or his friends, he will advise the kind of prostatectomy which, when performed by him, gives the best results.

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Atopic Dermatitis—Etiology and Clinical Management

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SUMMARY

Atopic dermatitis is primarily an allergic problem, similar in most of its aspects to that of allergic bronchial asthma. It should be studied and treated like asthma, with especial emphasis on the significance of inhalant allergens. It is doubtful that psychic factors are of importance in primary genesis of the disease although they may be involved in exacerbation of it.

FEW allergic conditions seem to be so difficult of management as is atopic dermatitis, also known as allergic eczema. Formerly considered a strictly dermatologic problem, it was included in the dermatologic scrapheap of eczemas and treated as such. In the absence of other explanations as to the cause of the disease, psychogenic factors often were considered paramount, as indicated by the designation of neurodermatitis. Beginning in 1932, however, through the efforts of Sulzberger, Hill, and others, the relationship of this condition to allergic reaction was clearly established. The evidence was the frequent association or alternation of atopic dermatitis with asthma or hay fever, the high incidence of family history of allergic sensitivity, the frequency of associated eosinophilia, the frequent occurrence of positive reaction to skin tests with food and inhalant allergens, and the clinical demonstration of the specific etiologic relationship of some allergens, notably foods, to the dermatitis.

Upon the basis of this evidence, Sulzberger and Coca[8] designated this condition as *atopic dermatitis* to indicate an inflammatory condition of the skin appearing in an individual who was, by virtue of heredity, predisposed to specific sensitization. According to these criteria, then, atopic dermatitis may be described as an acute, subacute or more often inflammatory disease of the skin involving especially the flexures and characterized by intense itching, papulation, thickening and lichenification of the involved areas. It is associated with specific sensitizations to "protein allergens" responsible for the development of characteristic forms of clinical disease in an atopic patient.

Following these reports, numerous and definite demonstrations of the allergic character of this condition were offered. The etiologic relationship of allergic reaction to foods, especially in infants and young children, was definitely established by Hill[4] and others. But as the patients were studied further, it soon became evident that this was not true for older children and adults; also that elimination of foods giving specific positive skin tests and even demonstrable circulating antibodies or reagins often failed to relieve the condition. This naturally has led to considerable skepticism as to the value of skin tests in atopic dermatitis. It also has invoked the consideration of other possible etiologic factors, notably psychogenic or infectious causes, recalling the era before 1932 when the disease was considered strictly a dermatologic problem to be treated by local applications, by non-specific therapy or by psychogenic means. No wonder many practitioners have been discouraged about treating patients with the disease. This discouragement is shared not only by general practitioners, pediatricians and dermatologists, but even by many prominent allergists. Thus for example, Cooke[2] in a recent monograph stated, "Evidence is also present for my belief that allergens producing only wheal reactions do not cause dermatitis and therefore skin testing for immediate wheal reactions is not a correct procedure for an etiologic diagnosis of these exudative skin lesions." It is not surprising, therefore, that many allergists and dermatologists are so confused as to the cause of this disease, the value of skin tests and especially as to the clinical management of patients. Fortunately, this has been contrary to the author's experience.

One of the chief reasons for this confusion appears to be the assumption that food allergens are the most important causative agents. Hence, when the elimination of foods to which the patient had positive reaction did not relieve the condition, it was assumed that skin tests were valueless. For some unknown reason, little or no attention has been given to the importance of inhalant allergens, even though many allergists, including Sulzberger, Feinberg, Figley, Rowe and others, have shown an etiological relationship between such allergens as house dust, silk, flour, horse dander and pollen and atopic dermatitis in susceptible patients. In order to further emphasize the significance of this relationship, the author recently reported[10] the results of a study of 54 patients with atopic dermatitis. Upon the basis of clinical and skin test evidence, this study showed that house dust, pollens (especially ragweed) and wool are outstanding inhalant offenders and that other inhalants like atmospheric molds, animals danders, silk, cooking odors, etc., likewise are prom-

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inent offenders. In many of the patients included in that series, a correlation between the specific inhalant to which there was a positive skin reaction and the patient's outbreaks could be obtained. Thus for example, some patients noted increase in itching of the skin after contact with dust. In other instances dust-sensitive patients were relieved by environmental change either to the hospital or seashore. In the latter group, dust desensitization properly carried out was followed by relief. Similar clinical and skin-test evidence emphasized the etiologic relationship of other inhalant allergens to atopic dermatitis.

While all this evidence suggests of course that inhalant allergens are important in atopic dermatitis, it still is purely clinical and open to questionable interpretation. However, the author and his associates[11] have been able to obtain more convincing proof in an experimental clinical study which was recently reported at the meeting of the American Academy of Allergy. In the latter study, atopic dermatitis was induced, apparently for the first time, by inhalation of the offending dust and mold allergens as well as by injection of the specific house dust extract. The study also evoked evidence that the reaction apparently is mediated through the sweating mechanism.

With this demonstration of the causal relationship of inhalant allergens, it becomes evident that in atopic dermatitis as in asthma both inhalant and food allergens can be etiologically significant.

Actually, there should be no surprise that inhalants are important in atopic dermatitis, especially in older children. That there is a close resemblance between atopic dermatitis and allergic bronchial asthma has been emphasized repeatedly by many investigators.[8] Those two conditions have so many characteristics in common, with regard to etiologic factors, diagnosis and treatment, that atopic dermatitis has properly been designated "asthma of the skin." Both conditions frequently coexist or alternate in the same patient. Atopic dermatitis in infancy often is supplanted by asthma of childhood or later life and vice versa. As in asthma, patients with atopic dermatitis are often worse in the winter and especially at the times of seasonal change from summer to fall and from winter to spring. Positive skin reactions are obtained in about the same proportion in both conditions and have about the same clinical significance. Sensitivity to foods is admittedly most important, not only in asthma of infants and young children but also in atopic dermatitis. Likewise, inhalant allergens are more prominent than foods in asthma affecting older children and adults; yet, strangely, the same reasoning has not been applied similarly to its counterpart in the skin.

As in asthma, not all inhalant allergens are equally significant as causal agents. The exact incidence is difficult to ascertain because most of the statistical data depend on skin test evidence. Nevertheless, in addition to the frequency of positive skin reactions, clinical experience also indicated that house dust is a prominent etiologic factor. Thus, for example, some patients will complain of increased itching after dusting; also in asthma, removal of the patient to another environment will be followed by relief. To illustrate:

CASE REPORT

CASE 1: The patient, a girl, aged 16, had flexural atopic dermatitis, recurrent since infancy, and was only symptomatically relieved by the usual local dermatologic management. Allergic study showed positive reactions to dust, wool, pollens, and some foods. The patient was always improved while at the seashore in the summer. This was attributed to the beneficial effect of the sun's rays. She was always worse in early fall and winter months. She was asked to go to the seashore in the spring and upon returning to go not to her own home but to the home of a relative in the same neighborhood. The skin condition cleared up at the seashore and did not recur even in the home of the relative, but it became worse within a day or two after she returned to her own home. Institution of proper dust precautions and desensitization with an autogenous house dust extract in addition to pollen therapy has been followed by pronounced improvement which has persisted for more than three years. It was subsequently determined by clinical trial that none of the foods for which there was positive reaction, with the possible exception of chocolate, were of etiological significance.

Question may arise as to whether, in these patients, the dust excitant acts by inhalation or by direct contact. Since in most patients the lesions involve the flexures, which usually are covered, it is unlikely that the dust will have a chance to act directly, but rather that it operates by inhalation. But if a sufficient amount of dust does come into direct contact with the skin, it can cause difficulty. This was demonstrated clearly in a patient with hay fever and other allergic manifestations who observed that when the house dust present on a dust rag was in direct contact with her skin, it caused pronounced itching. When the dust was inhaled, she first would sneeze or wheeze, and if this reaction was intense, itching of the affected skin would follow. Strict avoidance of contact with dust coupled with injections of the extract has enabled this patient to remain free of dermatitis for more than six years.

Further proof of the importance of inhalation of dust was obtained in the experimental study already mentioned when dermatitis was induced after inhalation of the dust by the patient. It would seem, therefore, that house dust probably is just as important an allergen in atopic dermatitis as in asthma.

Allergy to pollens likewise is an important cause of atopic dermatitis but is apparently neglected in the consideration of the causes of the disease despite reports by Cazort,[1] Feinberg,[3] Rowe[5] and others. There were few of the patients observed by the author who did not have positive reaction to pollen, notably ragweed. In some, the positive pollen reaction can be explained by concomitant hay fever or by a family history of hay fever, and in such instances it has no etiologic relationship to the skin condition. But in many others, it is definitely causal and may induce pronounced aggravation during the season, as for example in the following case:

CASE REPORT

CASE 2: A male, aged 35, was observed in March 1945 with pronounced generalized atopic dermatitis of two years' duration and a history of seasonal hay fever and asthma since the age of nine; also occasional migraine and urticaria occurred and there was a history of hay fever in the father. With the onset of the skin condition in July 1943, there was very little hay fever or asthma—in fact during 1944 only one day of hay fever and asthma. But during August and September 1944, atopic dermatitis was so severe as to require hospitalization for a month with little relief until the hay fever season was over. This experience was so bad that the patient dreaded the approach of another season. Intracutaneous skin tests showed pronounced positive reactions to ragweed pollen and house dust and in lesser degree to other inhalants and foods. Ragweed and dust desensitization was instituted with beneficial results which were still in effect when the patient was last observed in August 1945.

This case report clearly suggests the possible etiologic relationship between sensitivity to pollens and atopic dermatitis. Thus the hay fever and asthma present for many years were replaced almost completely by the dermatitis which was greatly aggravated by the ragweed sensitivity. When the ragweed season was over, the dermatitis was prolonged and became perennial from the same factors, inhalant or otherwise, which operate in perennial asthma secondary to seasonal hay fever.

This tendency for alternation—that is, for one allergic condition to be replaced by another at various times of life—is characteristic of the so-called hay fever-eczema (atopic dermatitis) group of patients, and has been noted by Brocq and many early observers. Sometimes, however, mild outbreaks of the dermatitis appear during the pollinating season, as for example, in the following case report:

CASE REPORT

CASE 3: The patient, a girl five years of age, was first observed at the age of two with atopic dermatitis present since infancy. The parents were told by a pediatrician that the child would grow out of it and only local applications were prescribed. The family history was strongly positive for allergic sensitivity. Positive skin reactions were obtained to house dust, wool, ragweed, milk and a few other foods. The condition was greatly improved by eliminating milk and wool; also by minimizing house dust contact and seashore environment. When first observed the patient had no hay fever symptoms nor was there any flare-up during the ragweed season despite a definite positive skin reaction. But when she was five years of age, while at the seashore in August, she had mild hay fever symptoms which were accompanied by a mild outbreak of atopic dermatitis in the flexures and on the face.

In this case, despite the elimination of the offending allergens from the diet and although the patient was in an environment where she previously had been well, both the dermatitis and hay fever symptoms appeared simultaneously, apparently from inhalation of ragweed pollen. Skin sensitivity to the latter had manifested itself at the age of two, antedating the clinical sensitivity which did not show itself until three years later. This is a good example of a positive skin reaction which represented future or potential clinical sensitivity.

Appreciation of the possible role of pollen sensitivity in atopic dermatitis therefore is essential to the proper management of patients with the disease. Where a possible causal relationship can be established by history or skin test findings or both, pollen desensitization has been definitely beneficial. In the absence of definite history of seasonal aggravation but with positive skin reactions to pollens, it is difficult to decide whether pollen therapy is advisable. If the patient has a positive family history of hay fever or very mild nasal symptoms, the author believes that pollen therapy may be valuable from a prophylactic standpoint even if the pollen sensitivity has no bearing on the skin condition. This opinion is not shared by other allergists.

Sensitivity to atmospheric molds also may be an important etiologic factor in atopic dermatitis, but it is unlikely to be of much significance in the eastern area since the incidence of mold allergy in hay fever or asthma is low there (about 5 per cent) compared with other regions, notably the Middle West. In a series reported by the author, about 15 per cent of the patients with positive reactions to pollens also reacted in slight degree to such molds as alternaria and hormodendrum, but no definite etiologic relationship could be established in that group. However, in the previously mentioned experimental study, atopic dermatitis was induced by the inhalation of alternaria, proving an etiologic relationship.

Sensitivity to animal danders also may be important in atopic dermatitis, but, as in asthma, the exact incidence is difficult to estimate. Thus, many patients have slight or moderately positive skin reactions to feather extract, but it is not always easy to decide whether such reactions were clinically important, first because feather extracts often give non-specific positive reactions and also because clinical relationship could not be easily proved. The patients who have such a reaction probably do not inhale enough feather allergen to produce atopic skin manifestations; nevertheless, sensitivity to feathers may be an additional excitant. Horse, rabbit, cat and dog danders are not prominent causes of atopic dermatitis, probably because of lessened opportunity for contact. Only about 10 per cent of the patients studied had positive skin reactions to extracts of these danders; however, several patients noted definite itching of the affected skin areas or new outbreaks when they were near a cat, dog, rabbit, or horse, even though not in direct contact with the animal. In at least three patients improvement in the skin condition seemed to follow removal of cats to whose dander they had positive reaction. As in asthma, skin tests with extracts of cat, dog, horse or rabbit epithelium are quite specific. When such reactions are present in a patient with atopic dermatitis, diligent search should be made for possible sources of contact.

The importance of wool as an etiologic factor in atopic dermatitis is unquestioned. But whether wool acts as an inhalant or as a contact allergen, or whether it causes aggravation by non-specific irri-

tation, is not always easy to determine. Of the 49 patients studied, 18 stated clearly that itching followed when wool was brought into contact with the skin lesions or even with the normal skin. Undoubtedly, in some of these patients direct contact action is operative and not all of it is due to specific allergic sensitivity. Nevertheless, many patients showed definite improvement when the woolen articles of clothing or bedding were removed completely. Since such articles are not always in direct contact with the lesions of dermatitis, it may be assumed that some of the wool allergen entered the circulation after being inhaled. As with feather extracts, skin tests with wool extract may be non-specific. Thus while 34 of the 49 patients tested had slight to moderate positive reaction, some of the reactions probably were non-specific. A striking instance of wool sensitivity is illustrated in the following case report:

CASE REPORT

CASE 4: A woman 82 years of age was first observed in the hospital with an acute flare-up of generalized dermatitis of the atopic type of several years' duration. Prior to admission the patient had been hospitalized in another institution and was greatly improved until shortly after discharge when, while out on a sun-porch in Atlantic City, she was wrapped in a woolen blanket. This was followed almost immediately by an acute flare-up which again required hospitalization. The patient had eosinophilia (17 per cent) and the family history was positive for atopic dermatitis. Reactions to intracutaneous skin tests were positive for house dust, wool, chocolate and tomato. The patient was greatly improved following the stay in the hospital. She was given instructions regarding avoidance of wool and house dust, but despite this, mild aggravation of the skin condition occurred, due to contact with wool and house dust.

A similar situation exists in relation to silk. Patients with atopic dermatitis may show positive skin reaction to this allergen. Thus 18 of 49 patients tested showed positive skin reaction; in four the reaction was moderate or pronounced. None of these patients apparently noted any evidence of clinical sensitivity, although this is not easy to detect. However, as previously mentioned, evidence that silk can be responsible for aggravation of symptoms in patients with atopic dermatitis has been furnished previously; while it had been believed that, as with wool, the reaction is provoked by direct contact of the silk with the patient's skin, the experiments of Sulzberger and Vaughan[9] conclusively demonstrated that silk protein when inhaled is absorbed into the circulation and thus can aggravate or induce the lesions of atopic dermatitis. It is not always possible to determine in a silk-sensitive patient which route is culpable. Reactions to patch tests frequently are negative, but this does not exclude possible contactant action. Regardless of the method of action, it is advisable for patients with positive reaction to silk to remove all possible sources of silk contact.

Other inhalant allergens like orris root, tobacco, insecticides, goat hair, cereal flours, etc., are possible but infrequent causes of atopic dermatitis. Thus for example, occasional instances have been reported of atopic dermatitis secondary to inhalation of cereal flours, especially in bakers, but these are the exception rather than the rule. Even the inhalation of the odors of cooking, especially of fish, or of perfume may cause aggravation in some patients. Interest again has been revived in the possibility that sensitivity to human dander is a causative factor in atopic dermatitis, especially in infancy. Allergic reaction to human dander was first described in 1925 by Van Leeweun[12] who considered it important in bronchial asthma. But this was never clearly proved and the subject was dropped. Recently Simon[7] reported positive skin reactions to human dander and positive results of passive transfer tests in infants with atopic dermatitis. He postulated that in such instances the human dander present in the scalp of the mother or father may aggravate the lesion either by direct contact with the skin or as a result of inhalation. No definite etiologic relationship has been established as yet between the dermatitis and sensitivity to human dander.

As previously mentioned, allergic sensitivity to food long has been considered the major etiologic agent in atopic dermatitis, probably because the sensitization is hematogenous and food allergens are known to be absorbed into the blood after ingestion. As early as 1915, Schloss[6] attributed infantile eczema to such foods as eggs, milk and cereals. His observation subsequently was corroborated by many others and especially by Hill[4] who showed that in young children with atopic dermatitis, removal of allergenic foods, particularly eggs, from the diet was followed by pronounced improvement or even cure, and that reintroduction of them into the diet brought about a recurrence. There is little question, then, that food sensitivity is important in infants and young children. It is only in older children and adults that its significance has been doubted, and, as already has been emphasized, this is explained by a failure to consider the inhalant allergens in the older age groups. This does not mean that food sensitivity is of no importance in older children or adults. It bears the same relationship as in asthma, where elimination of foods to which there is specific reaction is followed by relief and the reintroduction of them by aggravation. The author has found this as true with regard to adult patients with atopic dermatitis as it is to those with asthma.

The specific food allergens most frequently responsible for atopic dermatitis are well known. Egg is especially prominent. Sensitivity to egg should be suspect in all cases of atopic dermatitis even when the reaction to a skin test is negative.

CASE REPORT

CASE 5: A man 40 years of age had atopic dermatitis that had begun as a generalized eruption in infancy, then had become flexural in distribution with repeated recurrences since. The eruptions were more persistent on hands and face. Early and late hay fever complicated by mild asthma had occurred since the age of 12, but these symptoms had been greatly lessened by specific pollen therapy. Over the years, considerable and varied treatment had been given for the dermatitis, including local medicaments, x-ray, sunlight,

fever therapy, and more recently psychotherapy with only temporary beneficial effect. The patient had been tested previously but was told that foods were of no etiologic importance.

When first observed by the author, the patient had definite areas of atopic dermatitis on the cheeks, about the mouth, on the flexures and especially on the wrists and hands.

Intracutaneous skin tests revealed significant positive reactions to house dust, feathers, wool, tobacco, timothy, ragweed, English plantain, cornmeal, wheat, milk, cheese, chocolate, tomato, and a few other vegetables. On repeated testing, reaction to egg was negative.

Elimination and avoidance of positive inhalants was followed by only slight improvement. The patient then was put on a trial diet and after ten days to two weeks showed striking improvement. However, when egg was added to the diet, a pronounced flare-up occurred. When the dermatitis had subsided, another trial with egg was followed by a flare-up. Since then, no egg has been taken and the skin condition has been quite good except when the patient eats proscribed foods.

This case report illustrates very well the fact that patients with atopic dermatitis, even adults, may have allergic sensitivity to certain foods even though reaction to skin tests with allergens of them are negative. It emphasizes the importance of diet trial in such patients, especially if elimination of test-positive allergens does not relieve the condition.

Probably next in frequency to egg among the causative foods are milk and wheat. While any food allergen may be important, the exact incidence or the relative etiologic significance of any particular food is difficult to estimate because this information depends upon skin test reaction rather than upon clinical evidence or diet trial.

In addition to inhalant and food allergens, atopic dermatitis, like asthma, may be caused or aggravated by other factors, including bacterial, physical and psychosomatic.

The etiologic significance of bacterial agents is hard to estimate because it is difficult to establish an etiologic relationship. Bacterial sensitization from an infected focus (e.g., tonsils or teeth) may be responsible for atopic dermatitis. But this is even harder to prove in patients with atopic dermatitis than it is in those with asthma, since skin tests for sensitivity to bacteria are unreliable and even constitutional reaction from injected vaccine is less likely to provoke atopic dermatitis than it is to cause asthma. Proof is made additionally difficult by the fact that atopic dermatitis generally is worse in the winter or at times of seasonal change (summer to fall or winter to spring) when upper respiratory infections are prevalent. But (as was explained in the discussion of asthma) symptoms similar to those of infection in the upper respiratory tract may be due to allergic rhinitis provoked either by atmospheric changes or by excessive exposure to environmental allergens (e.g., dust or wool). Bacterial sensitization therefore is a possible secondary or aggravating factor but seldom is primary in invoking atopic dermatitis.

Atopic dermatitis also may be aggravated by various physical factors such as heat, cold, and physical exertion, just as is the case with asthma. In fact, any influence tending to increase skin irritability or to stimulate skin congestion and sweating also will either increase the tendency toward or actually aggravate already existing dermatitis. This applies to bacterial toxins or toxic products absorbed from the gastrointestinal tract, as in so-called "auto-intoxication"; also, probably, to such factors as fatigue, overfeeding or even dentition, mentioned often as a possible cause of atopic dermatitis. Experimental studies of this condition[11] indicated it is very likely that disturbances of the sweating mechanism may initiate or aggravate dermatitis.

The significance of psychosomatic influences in the production of atopic dermatitis likewise is a moot question. That they might be important is indicated by the continued use, especially by dermatologists, of the term "neurodermatitis" although it originally was intended to indicate vasomotor instability and not neurogenesis or psychogenesis. Unquestionably, emotional upsets and perhaps hidden or subconscious influences of various sorts can cause aggravation of the skin lesions. But, as in asthma, it is doubtful that such factors can be responsible primarily or entirely for the condition. The outstanding primary symptom of atopic dermatitis is itching, which causes the patient to scratch. This leads to subsequent thickening of the skin and explains the secondary excoriations and other changes in the skin. Undoubtedly, the degree of itching and secondary change will be greater in the overanxious, emotionally unstable psychoneurotic patient, but this does not prove necessarily that the primary factor responsible initially for the itching is psychosomatic. Another item of evidence against primary psychogenesis is the fact that this condition so often starts in infancy or early childhood, an age period in which psychosomatic influences supposedly seldom operate.

CLINICAL MANAGEMENT

As with other allergic diseases, treatment of atopic dermatitis may be specific, non-specific and/or symptomatic. The specific treatment of atopic dermatitis will depend largely upon whether the causative factor has been ascertained. Complete allergy study, including history, tests for sensitization and diet trial, is essential. Despite the current confusing reports, all patients should be tested for allergic reaction either by the scratch or intracutaneous method or, if this is not possible, as in eczematous infants, by the indirect or passive transfer method of Walzer. Patch tests are valueless from a practical standpoint and although study of them has been of some academic importance, they should not be used in the determination of offending excitants.

If the specific allergens to which the patient is sensitive can be determined, avoidance of contact with them or elimination from the diet, as the case may be, often will be followed by improvement or complete relief, especially if a specific food such as egg, milk or wheat is the principal excitant. Complete elimination of the latter foods is essential if the patient has allergic sensitivity to them. Due care

should be taken to see that no foods are taken which contain these elements even in small amounts. Removal of milk from the diet of infants may seem difficult, but efficient substitutes are available.

The striking benefits which sometimes follow food elimination are exemplified in the following case report:

CASE REPORT

CASE 6: A male child, 22 months of age, was first observed in June 1949 with "eczema" which had been present since early infancy. Some improvement had followed milk elimination but in April 1949 there was pronounced increase with subsequent progression. Mild attacks of rhinorrhea and slight wheezing were noted in June 1948. Family history was strongly positive for allergic disease; the mother was being treated for hay fever. When first observed, the child had severe atopic dermatitis affecting especially the flexures.

Reactions to intracutaneous skin tests were positive to house dust, ragweed pollen and also to milk, wheat, chocolate, green pea, tomato and string bean.

Following the initial examination and because of the history, milk was eliminated completely. This was followed by slight improvement. Later, when the tests were finished and all the test-positive foods eliminated, the dermatitis cleared completely. The mother noted that this was especially striking after tomato was taken away. This improvement has been maintained except for a mild outbreak after the ingestion of string bean given for purposes of diet trial and also after the ingestion of chocolate by the child unknown to the mother.

It is to be notetd that in this patient recovery followed elimination of foods alone and that, so far, desensitization procedures have not been necessary. But if there is recurrence which can be traced to inhalants, injections of the appropriate extracts will be given.

When specific food excitants are not revealed by the usual diagnostic methods or even during the course of further study, the patient should be placed on an elimination or trial diet for a period of one to two weeks, then individual foods added and the effect upon the eruption noted. If improvement follows, the diet trial should be continued until the eruption disappears. If not, other diets should be tried in order to determine definitely whether sensitivity to food is a factor. It must be remembered that the improvement in atopic dermatitis is much slower than in asthma; hence, the method of treatment should not be changed until sufficient time has been allowed for improvement to take place following the withdrawal of a certain food. Dietary restriction should not be too rigid in infants or young children with numerous positive reactions; it is preferable to exclude first the most important of the items to which there was positive reaction. Sufficient minerals and vitamins also should be added to compensate for any diminution caused by the dietary restriction.

Elimination of offending inhalants is just as important for patients with atopic dermatitis as it is for those with asthma. This may be easy with some allergens, such as feathers, and difficult with others such as house dust. If wool is a factor, the patient should be told either to provide substitutes (e.g., a cotton quilt for a woolen blanket) or to keep the wool covered in such a way as to prevent its coming into direct contact with the skin (as by lining woolen snowsuits for children with cotton sheeting) or from being inhaled (as by encasing a woolen blanket in a heavy cotton blanket cover). When inhalant contact cannot be completely avoided, specific desensitization may be required. This is true especially with regard to house dust, pollens and molds. Desensitization with extracts of animal danders or wool is not very effective but seldom is necessary.

Care should be exercised in the desensitization procedures, especially with house dust and pollen extracts. Constitutional reactions are slower in dermatitis than in asthma or hay fever and are indicated by aggravation of the dermatitis in 24 hours or longer rather than by acute flare-up. For example, a patient was being given injections of an autogenous house dust extract, and when the point of maximum tolerance was reached, further injections were followed in a day or two by new outbreaks of dermatitis. The injections were stopped and the skin cleared up. Later, the injections were begun again in lower dosage which was tolerated much better.

It is extremely important for the attending physician to recognize the delayed nature of reactions to these injections which might be responsible not only for aggravation of the dermatitis but also for persistence of it.

Non-specific measures sometimes may be required if specific treatment fails or if progress is slow. In the author's experience, however, nearly all our patients respond to specific treatment. Among the most often used of non-specific measures is autohemotherapy, which occasionally may be helpful in stubborn cases. Vitamin injections (notably vitamin B) are used extensively by dermatologists who believe them to be helpful in chronic cases. The author has had no personal experience with them nor observed indication for their use. Bacterial vaccines, either stock or autogenous, have a very limited application although some physicians claim good results with autogenous vaccines prepared from various foci of infection. Injections of histamine in increasing dosage are commonly used, but as in asthma the beneficial effect is limited and difficult to judge. But it is worthy of trial in selected cases. The author sometimes finds it useful as a substitute for other injections given for purposes of desensitization (e.g., house dust extract) especially when the latter is suspected of inducing reaction or producing aggravation of the existing dermatitis.

Regardless of whether specific or non-specific treatment is required, symptomatic or palliative measures usually are necessary even during the period of diagnostic study, to relieve the itching. These include local remedies to aid in the disappearance of the lesion. It often is surprising, however, how little local treatment may be required for patients in whom the causal factor has been found

and eliminated. Just as it is the wheezing which requires relief in asthma, in atopic dermatitis it is the itching. For itching causes repeated scratching which in turn aggravates the lesion and is responsible for excoriation and secondary infection and thickening of the skin. To reduce the damage of scratching, the nails should be kept short and the fingers clean to prevent secondary infection. If possible the lesions should be kept bandaged day and night to prevent access to them. Cardboard cuffs over the elbows and forearms may be necessary. The arms and legs may have to be tied to the side of the crib or bed.

The itching may be reduced by various local applications of soothing agents. For this purpose, it is well to obtain the advice of a dermatologist. Antipruritic lotions are helpful, especially if there is much itching and oozing. Bland ointments like Lassar's paste or those containing small amounts of crude coal tar likewise are beneficial. Soaps should be avoided and the skin cleansed either with olive oil or mineral oil or with soapless detergents. Roentgen-ray or ultraviolet therapy may be helpful in some cases but decision with regard to it is best left to a dermatologist.

Sedatives—bromides, barbiturates, chloral—may be used to relieve intense itching or to calm highly emotional patients. They may be given at regular intervals during the day, but especially at bedtime when the excessive warmth of bedclothes often increases itching. Coincident psychotherapy naturally should be given those patients requiring it, but in many instances calm reassurance will be sufficient.

The necessity for the use of psychotherapy seems to be inversely proportionate to the ability of the attending physician to find the cause of the dermatitis and to treat it successfully by specific measures. If specific cause is not found the patient is considered to be psychoneurotic and is treated accordingly. Then it may be noted that the dermatitis improves strikingly when the patient takes a vacation trip away from home in order to rest his "tired nerves," only to recur when he gets back. Recrudescence then is attributed, naturally, to the return to an environment conducive to emotional upset. That leaving home may also mean leaving environmental allergens is too often overlooked in such instances.

The antihistaminic drugs have been used extensively in the treatment of atopic dermatitis, but, as in asthma, it is difficult to evaluate correctly the statistical reports. Some patients obtain relief of the itching from these drugs given in full dosage orally three or four times daily. With so many drugs available, selection of one that is more effective than another would be difficult. The author has given Benadryl® or Pyribenzamine® with varying results; some patients benefited temporarily and others noted no benefit. It is the author's impression that the antihistaminics were more effective in patients with associated nasal symptoms than in those without them, which is to be expected if inhalants are responsible for the dermatitis. In the experimental study previously mentioned, it was found that Benadryl administered either by intramuscular or intravenous injection in doses from 20 to 50 mg. produced better results than it did when given orally. If the dermatitis was mild, it subsided more quickly with the drug than without; if severe, subsidence was slower. This is comparable perhaps to the effect of epinephrine in asthma. At any rate, it appears that antihistaminics may give symptomatic relief in some patients with atopic dermatitis and are worthy of further trial.

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Intracranial Angiography in the Treatment of Cerebral Vascular Accidents

Reports of Cases and a Review of the Literature

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SUMMARY

Five cases of intracerebral hematoma, including one case of calcified intracerebral hematoma, are presented and treatment is discussed.

The role of carotid arteriography, stellate ganglion blocks, vasodilator drugs and operation in the treatment of cerebral vascular accidents is discussed and typical cases of the various vascular anomalies of the cerebral vascular system are presented.

THE successful surgical treatment of a number of cerebral vascular lesions including five cases of intracerebral hematoma prompted a review of the literature concerning the methods of treatment of lesions of this type.

During the past decade or so there has been a change in the therapeutic approach to the problem of intracranial vascular accidents. Penfield[38] in 1933 said, "The right of the aged and hypertensive to die from apoplectic stroke undisturbed has been unchallenged for a long time." He concluded, after reviewing records of patients observed by him, that with careful study and selection of patients it "might be possible to do something for a larger number of them." Cushing,[14] Craig and Adson,[12] Rankin,[41] Pilcher,[39] Woodhall,[58] Klemme,[27] Karlen,[26] King[29] and Abbott[1] are a few among the many who have successfully challenged the right of these patients to "die undisturbed." Huesner[24] in 1888 was probably the first surgeon to report the evacuation of an intracerebral hematoma with recovery of the patient. In 1941 Meridith[36] reported that only 17 cases of surgically treated intracerebral hematoma were reported in the medical literature. By 1943 that number had increased to 33. Recently many instances of successful surgical treatment of cerebral vascular lesions of the type hitherto regarded as hopeless have been reported in the literature. These include the surgical removal of intraventricular hematomas,[13] ligation of aneurysms of the left middle cerebral arteries[49] and the successful treatment of lesions of the basilar and vertebral arteries.[30] Dandy[15] stated that he knew of no successful attack on lesions of those vessels, and his report of a sudden death upon manipulation of one vertebral artery has made most surgeons loath to work in that area.

With the more general use of the carotid arteriogram as an adjunct in the diagnosis, the indications for surgical aid for the patient with a cerebral vascular lesion are more definite. When the arteriogram is done by the percutaneous method as first demonstrated by Lowman and Meyerson[35] in 1936 and later by Shmidzu,[48] Brobeil,[7, 8] Kristiansen[31] and Lindgren,[33] it spares the critically ill patient the minor trauma incident to exposing the carotid artery in the neck. King,[28] Engeset,[16] Radner[40] and others have described similar methods for injecting the vertebral arteries. Wechsler,[57] List[34] and Gariepy,[17] to mention a few among many, have stressed the fact that carotid angiography is a safe diagnostic procedure that does not increase the surgical risk for patients who are in a precarious condition. List[34] stated, "It [angiography] carries little risk even in patients with high intracranial pressure since it does not interfere with intracranial hydrodynamics." A consideration of the mechanisms involved makes it readily apparent that the force that can be exerted through a 19-gauge needle by hand pressure on a rapidly flowing column of blood, in a vessel as large as the common carotid artery, is negligible; especially when it is remembered that the total flow of blood through the brain in the human is in excess of 600 cc. per minute.[19, 46]

According to Aring and Merritt,[4] Albertini,[2] Taylor and Page,[53] Buzzard,[9] Bidwell, [5] Church[10] and others, clinical differentiation of hemorrhage, thrombosis and embolism is not difficult. After studying two series of patients totaling 652 cases, Aring and Merritt concluded, "A thorough study of the history with the results of the physical and neurologic examinations and examination of the spinal fluid should make a differentiation possible in nearly 100 per cent of the cases." They pointed out that sudden severe headache, vomiting, stiffness of the neck and progression of symptoms are strongly indicative of hemorrhage and that these findings were present in 51 per cent of the hemorrhage cases reviewed. Spinal fluid pressure greater than 300 mm. of water did not occur with thrombosis but was noted in 38 per cent of the cases of hemorrhage. In 18 per cent of the patients with hemorrhage the spinal fluid pressure was above 400 mm. of water. Blood in the spinal fluid was observed macroscopically in 74 per cent of the patients with hemorrhage and in only 0.15 per cent of those with thrombosis.

From the Neurosurgical Service of the Veterans Administration Hospital, San Francisco.

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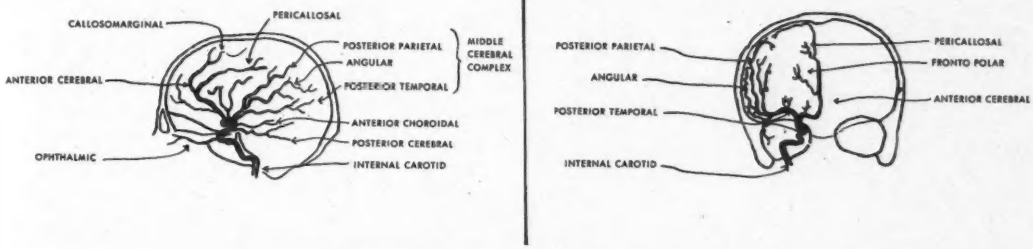
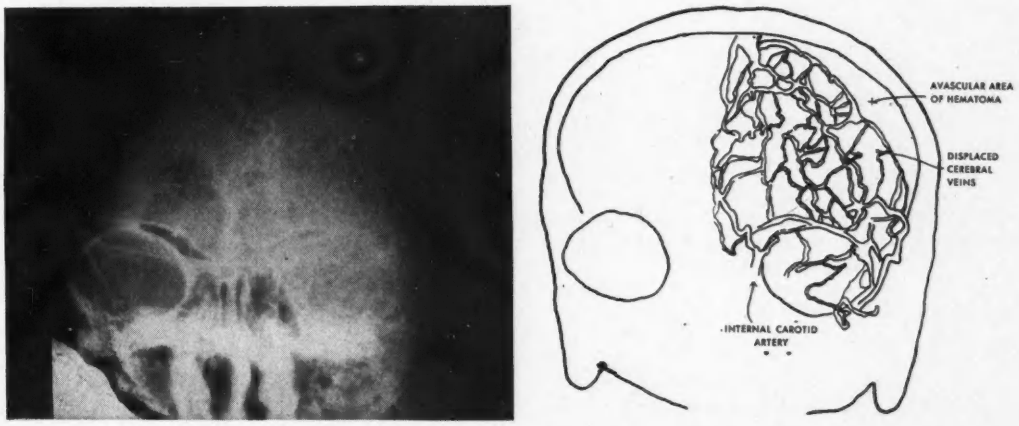
Rowbotham[44] said that in cases of intracerebral bleeding the spinal fluid contains blood. The authors did not find this to be so in cases observed by them (Case 4, intracerebral hematoma; and Case 8, traumatic arteriovenous fistula).

The frequency of occurrence of the various types of lesions in a series of 407 cases studied at the Boston City Hospital was: Thrombosis, 81.15 per cent; hemorrhage, 15.0 per cent; embolism, 3.2 per cent.

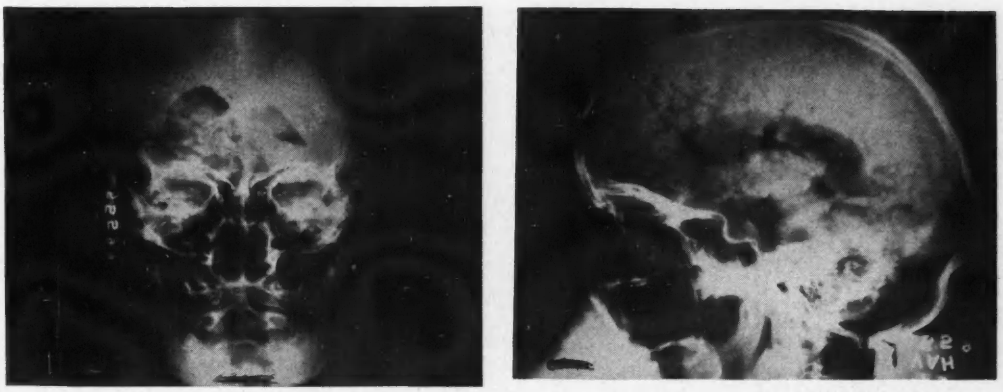
Alvarez[3] pointed out the necessity of taking a



A. Tracings of normal arteriograms.



B. Angiogram and tracing of a subdural hematoma.



C. Pneumoencephalogram showing depression of left lateral ventricle by subdural hematoma.

Figure 1

careful history from older people, in whom, he believes, small, usually unrecognized strokes are a common cause of illness. Globus[18] stressed that there is, in many patients, ample evidence of the disease process prior to the first episode of hemorrhage.

Where clinical signs are not of a localizing nature, as is often the case, Woodhall[58] and others report successful localization of the hemorrhage by electroencephalogram. This method has been of aid to the authors in several cases. Groff and Grant[21] pointed out that the clinical picture occurring with rupture of the middle meningeal artery or one of its main branches is often not sufficiently characteristic to differentiate it from other intracranial hemorrhages, but that the angiogram is strikingly characteristic. This is well illustrated in one of the cases observed by the authors (Figure 1, *b* and *c*). Shenken[47] stated that in cases of rupture of the middle meningeal artery or one of its main branches, surgical treatment, to be of any value, must be given within three to six hours or before decerebration occurs.

In cases of thrombosis or cerebral embolism, pronounced improvement in the clinical picture is often obtained by the use of stellate ganglion block and by the use of vasodilating drugs. De Takats,[52] Volpitto,[56] Risteen,[43] Gariepy[17] and others have reported rather amazing results following the use of stellate ganglion block. The authors have observed cases in which aphasia, hemiparesis and lesser neurologic disorders disappeared after stellate ganglion block, often done bilaterally. Rankin,[41] Cobb,[11] Ochsner and DeBakey[37] and others have pointed out the importance of relieving the vasospasm incident to cerebral thrombosis and embolism. Risteen and Volpitto[43] observed, during operation, the vasodilating effects of stellate ganglion block on the cerebral vessels. Villeret and Cachera,[55] working with experimental animals, observed through a window in the skull that, in all cerebrovascular accidents, surrounding the hemorrhagic or ischemic zone there is a zone of stasis and vasoparalysis with segmental spasm of the vessels. De Takats and Gilbert[52] recommended the use of aminophylline in doses of 0.3 to 0.5 gm. given intravenously with stellate block. They noted in animals that bilateral stellate block was much more effective than unilateral block. Reese[42] reported on the beneficial effects of 0.12 gm. of aminophylline thrice daily in arteriosclerotic patients with neurologic deficits. Howard[25] and coworkers, who did extensive work on the physiologic action of aminophylline, reported that it reduced venous pressure, stimulated respiration and shortened circulation time.

Intracerebral Hematoma:

CASE REPORTS

CASE 1: A 30-year-old white male, admitted to the hospital in a comatose state, had complained of headache that morning and at noon was found unconscious. There was nothing of significance in the past history.

At the time of examination the patient was unconscious, lying with the left arm and leg flexed. There were convulsive motions of the right arm. The skin temperature was definitely lowered on the entire right side of the body. The pupils were equal and reacted to light. The neck was very stiff and Brudzinski and Kernig signs were present. Reflexes were increased on the right and Hoffmann's sign on the right was noted. Response to painful stimuli was greater on the left side of the body than on the right. There was gross blood in the spinal fluid and the pressure was 490 mm. of water.

The patient remained comatose. The spinal fluid gradually cleared to a xanthochromic color. A left common carotid arteriogram on the eighth day (Figure 2, *a* and *b*) showed posterior-inferior displacement of the middle cerebral complex of vessels and anterior-inferior displacement of the anterior cerebral artery.

A ventriculogram (Figure 2, *c*) revealed depression of the frontal horn of the left lateral ventricle. A 6-cm. intracerebral clot was removed from the left frontal lobe, leaving a smooth-walled cavity without bleeding points. The postoperative course was uneventful and the neurologic deficits disappeared. The patient returned to work after a convalescence of six weeks, and a three-year follow-up was uneventful.

CASE 2: A 33-year-old white female was admitted to the Sonoma County Hospital with a purulent discharge from the right ear. Subtotal mastoidectomy had been done 21 days before, and three days later the patient complained of headache, became very talkative in a repetitious manner and showed pronounced loss of normal inhibitions. This state was followed by profound lethargy from which the patient could be aroused only with great difficulty. The following day the pupil of the right eye dilated, and then both pupils became fixed to light. However, slow improvement followed, and upon spinal fluid tap the pressure was normal and the fluid xanthochromic. There were 22 lymphocytes present in each cubic mm. The patient was discharged from the hospital and was readmitted seven days later with the previously noted complaints.

The patient was semi-comatose. The blood pressure was 130 mm. of mercury systolic and 80 mm. diastolic, and the temperature was 98.4° F. The pupils were equal and reacted to light. Pronounced stiffness of the neck was noted. Papilledema was not present. The patient did not move the left extremities. The reflexes were increased on the left and response to painful stimuli applied to the left side of the body was less than to the same stimuli applied on the right. A right homonymous hemianopsia had been detected before the patient became comatose. Pronounced xanthochromia was noted in the spinal fluid. Spinal fluid pressure was 290 mm. of water and there were 25 lymphocytes present in each cubic mm. The protein content was 102 mg. per 100 cc.

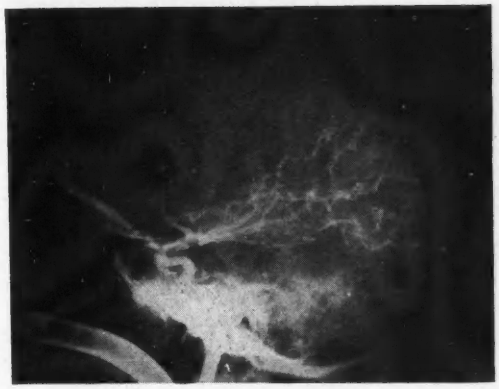
On the basis of these findings a burr hole was made over the anterior part of the right temporal lobe and an intracerebral hematoma containing 90 cc. of old blood was evacuated, leaving a cavity lined with old blood pigment which was washed out.

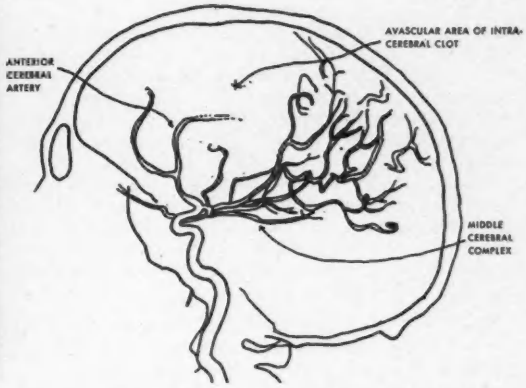
The patient regained consciousness on the operating table and the postoperative course was uneventful for the follow-up period of 18 months.

CASE 3: A 52-year-old white male was admitted with complaints of intense occipital headache, nausea and vomiting. There was weakness of the left side of the body.

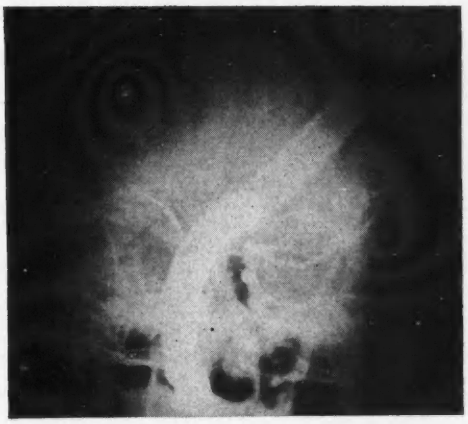
There was a history of hypertension for many years. The severe occipital headaches had been present for four months. Four days before admission the patient had awakened with headache and soreness and stiffness of the neck, and had vomited.

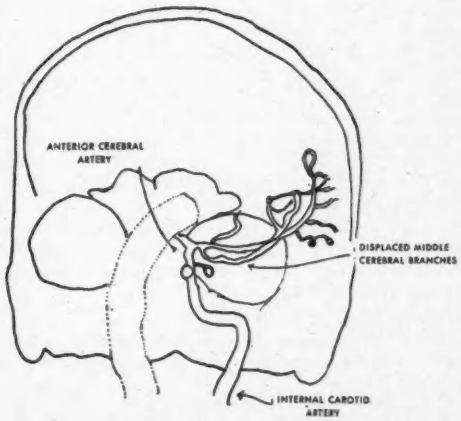
The patient appeared to be confused. The blood pressure was 160 mm. of mercury systolic and 90 mm. diastolic. The



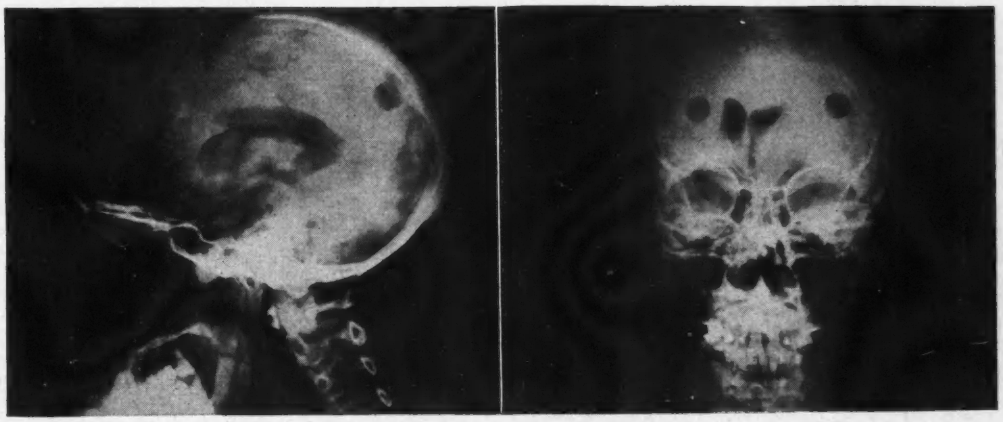


A. Intracortical clot. Angiogram showing displacement of the middle and anterior cerebral arteries.





B. Intracortical clot. Anterior-posterior angiogram.



C. Ventriculogram of above case – depression and shift to right of left lateral ventricle.

Figure 2

pupils were equal in size and responded to light. There was one diopter of papilledema bilaterally. The neck was very stiff. Spastic left hemiplegia and a left hemihypalgesia were noted. Hoffmann's sign and Babinski's sign were present on the left side. The spinal fluid was xanthochromic and at a pressure of 260 mm. of water. A right common carotid arteriogram was done and an abnormal vascular pattern was apparent in the distribution of the right middle cerebral artery.

A ventriculogram revealed depression of the right lateral ventricle with medial shift of the anterior horn. A semiliquid intracerebral hematoma was evacuated from the right frontal lobe. Recovery from the hemiplegia was uneventful and sensory deficit cleared. The patient remained well during a two-year follow-up.

CASE 4: A 23-year-old white male was admitted to the Merced County Hospital with complaint of weakness and numbness of the left extremities and inability to talk.

Well until the day of entry, the patient had noticed while at school that he could not hold a pencil in the left hand. Three hours later he noticed weakness in the left leg and he became aphasic. In x-ray films of the head enostosis of the parietal skull on the right was noted, and intracerebral calcifications were observed beneath the enostosis. A presumptive diagnosis of meningioma was made.

The patient was lethargic with spastic left hemiparesis and left hemihypesthesia. He was nauseated and vomiting. The left tendon reflexes were increased but no pathologically significant signs in fingers or toes were present. There was complete astereognosis in the left hand. The spinal fluid was normal. A small firm tumor of the right parietal scalp, presumably a lipoma, was noted.

The lethargic state progressed to coma, with severe headache and vomiting. Papilledema developed. A right carotid arteriogram revealed a large group of abnormal venous channels in the right parietal area.

A ventriculogram revealed displacement of the right lateral ventricle consistent with a high parietal mass on the right. At operation a number of abnormally large veins were encountered on the surface of the cortex. A large intracerebral clot was evacuated from the right parietal lobe. It contained calcium with old organized clot and fresh clot of jelly-like consistency. The patient gradually recovered from the paresis and the speech defect and remained well during a two-year follow-up.

CASE 5: A 27-year-old white male was admitted with complaints of left-sided headache, nausea, vomiting, blurred vision and transient attacks of complete aphasia.

There was history of a right-sided convulsion with unconsciousness at six months of age, with similar attacks intermittently for the ensuing six months. Three years prior to admission the patient had received a blow to the left side of the head in an auto accident. This had been followed by weakness of the right arm and leg, nausea and vomiting.

Hemiatrophy of the right side of the body was noted upon physical examination. The pupils were equal and reacted to light. There was no papilledema. There was right hemiparesis and hemihypesthesia with increased reflexes, but no pathologically significant signs in fingers or toes. Partial motor aphasia was noted. The spinal fluid was clear and the pressure was normal. A left common carotid arteriogram revealed a mass in the left parietal lobe.

A large mass of clotted thin-walled veins and an old organized hematoma were removed from the left parietal lobe. Postoperatively, mild motor and sensory loss on the right side of the body persisted. During a two-year follow-up the patient had one transient attack of motor aphasia.

Aneurysm of the Middle Cerebral Artery:

CASE 6: A confused, disoriented, 51-year-old white male was admitted with complaints of severe bitemporal headache, nausea, vomiting and stiffness of the neck.

The patient had been well until four days before admission, when severe bitemporal headache and nausea suddenly developed and coma lasting 20 minutes followed.

The pupil of the left eye was large and reacted sluggishly to light. There was left spastic hemiparesis without pathological reflexes. The spinal fluid was xanthochromic and the pressure was 410 mm. of water. A right common carotid arteriogram revealed an aneurysm of the middle cerebral artery (Figure 3, *a*). The patient died before he could be prepared for operation. Hemorrhage from aneurysm was demonstrated at autopsy.

Thrombosis of the Middle Cerebral Artery:

CASE 7: A 22-year-old Japanese male was admitted with spastic right hemiplegia and partial motor aphasia.

Five years previously, weakness of the right arm and aphasia had developed suddenly and a generalized convulsion had followed. The aphasia and weakness gradually cleared over a three-year period. A year previously the weakness and aphasia recurred and persisted for three weeks. The patient was hospitalized at that time and a diagnosis of multiple sclerosis was made. The condition remained unchanged.

Upon examination, partial motor aphasia, alexia and atrophy of the right extremities, superior right quadrantic hemianopsia, right hemiplegia with flaccidity, and right hemihypesthesia were noted. Hoffmann's and Rossolimo's signs were present. The spinal fluid was normal. A left internal carotid arteriogram revealed thrombosis of the left middle cerebral artery.

Bilateral stellate ganglion blocks and aminophylline gave only temporary improvement, probably due to the age of the lesion (five years).

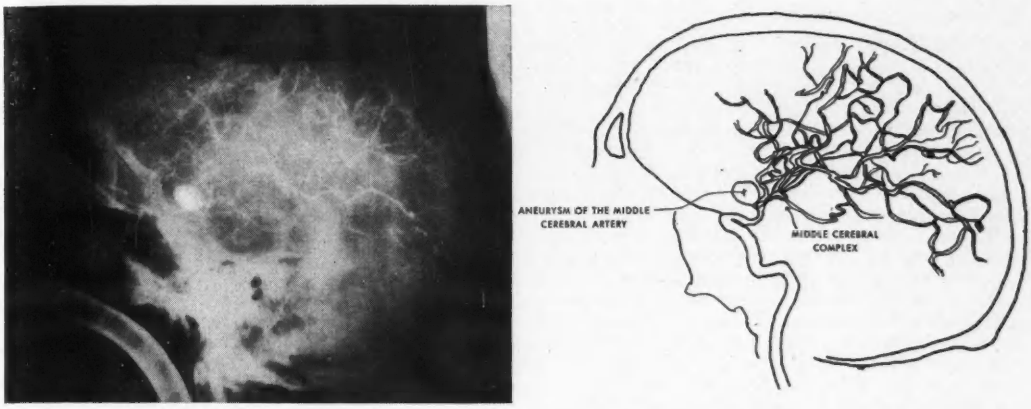
Traumatic Arteriovenous Fistula:

CASE 8: A 30-year-old white male was admitted with a painful pulsating exophthalmus of the left eye, nausea, headache and blurring of vision.

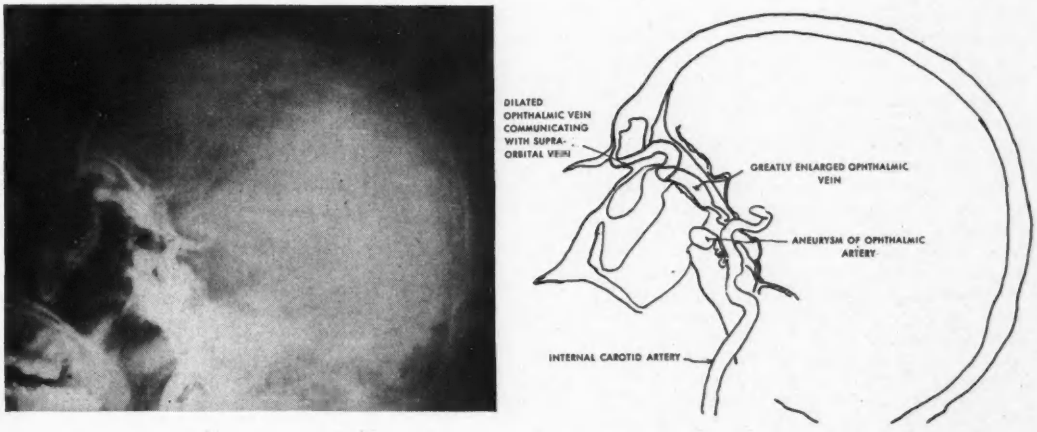
Two months previously the patient had received fractures of the left ankle and of the left ramus of the mandible, and abrasions of the left forehead, in an airplane crash. Three weeks before admission, pain in the left eye developed and was followed shortly by protrusion of the left eye and a roaring in the head.

Upon examination, pronounced proptosis of the left eye and moderate periorbital edema were noted. A loud systolic bruit was heard on auscultation of the head. Occlusion of the left carotid artery decreased the bruit. There was paralysis of all the external ocular muscles of the left eye and the pupil was fixed in the mid-position, indicating autonomic paresis as well as third, fourth and sixth nerve paralysis. There was loss of sensation over the first and second divisions of the trigeminal nerve on the left. A left carotid arteriogram (Figure 3, *b*) confirmed the clinical impression of a lesion of the left cavernous sinus.

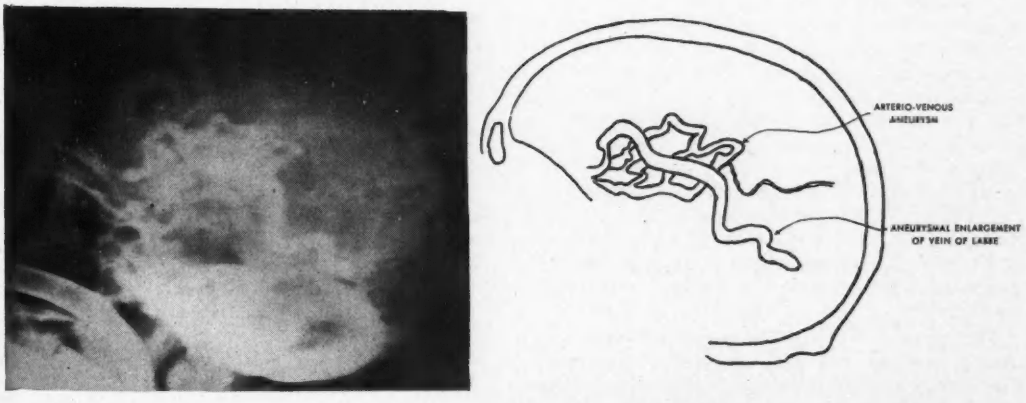
Intermittent occlusion of the left carotid artery was carried out. A clamp was devised which permitted occlusion to the point that the noise in the head could not be heard. The period of occlusion was gradually increased until it could be maintained for 60 minutes. The left common carotid artery was then ligated. This decreased the proptosis, headache and bruit. Ten days later the left external and internal carotid arteries were ligated. This resulted in disappearance of the bruit and gradual reduction of proptosis. During the two-and-a-half-year follow-up proptosis disappeared entirely and there was no recurrence of symptoms.



A. Aneurysm, left middle cerebral artery — lateral view.


DILATED OPHTHALMIC VEIN COMMUNICATING WITH SUPRA-ORBITAL VEIN
GREATLY ENLARGED OPHTHALMIC VEIN
ANEURYSM OF OPHTHALMIC ARTERY
INTERNAL CAROTID ARTERY

B. Arterio-venous fistula, right carotid and cavernous sinus.



C. Arterio-venous aneurysm supplied by middle cerebral artery.

Figure 3

Arteriovenous Aneurysm:

CASE 9: A 29-year-old white male was admitted with complaints of inability to talk, double vision and dizziness, with blurring of vision on turning the head to the left.

Twelve months previously, motor aphasia developed suddenly and was followed by gradual development of blurring of vision, nausea and coma. Spinal fluid pressure at that time was 310 mm. of water and the fluid was xanthochromic. At that time the patient was found to have bilateral papilledema and anopsia in the right lower quadrant. These conditions gradually cleared over a period of several months. Then aphasia and blurring of vision gradually returned, beginning about a month prior to the present admission.

The pupil of the right eye was large. Bilateral papilledema and right lower hemianopsia were noted. There was partial motor aphasia and right hemiparesis with increased reflexes. Stereognosis was impaired on the right. The spinal fluid was clear and the pressure was 250 mm. of water. A left carotid arteriogram (Figure 3, *c*) revealed a mass of enlarged vessels having the appearance of a cavernous hemangioma. The patient was not willing to undergo operation and was given a course of deep x-ray therapy which did not alter the clinical condition.

Arteriovenous Aneurysm of the Scalp:

CASE 10: A 26-year-old white male was admitted with complaints of pain over the left side of the head, and in the left eye, and a buzzing noise in the left side of the head.

Nine years previously the patient had received a severe blow to the head in an automobile accident. A soft swelling over the left temple had persisted since the time of the accident. The noise and the pain had been first noticed two years previously.

Upon examination, a soft, smooth, non-pulsating swelling over the left side of the head was observed. There was a thrill on palpation, and upon auscultation a high-pitched bruit, which disappeared on compression of the left carotid artery, was noted. There were no other significant neurologic findings. A large "port wine stain" of the left cubital fossa was noted. A phonocardiogram revealed that the bruit had both systolic and diastolic components. A left common carotid arteriogram revealed an arteriovenous angioma of the superficial, temporal and frontal arteries of the scalp. This lesion was removed completely with immediate relief of signs and symptoms. The patient remained well during a three-year follow-up.

DISCUSSION

It is of interest to note that in several of the cases of intracerebral hematoma here reported, a smooth-walled cavity remained after removal of the clot. This finding is in agreement with the observations of Scheinker,[45] Craig and Adson[12] and many others who have expressed belief that many spontaneous intracerebral hemorrhages are of venous origin. Sachs, in discussing this problem,[45] pointed out that in children spontaneous intracerebral hemorrhages are almost always of venous origin. In one patient treated by the authors (Case 5) the hemorrhage was undoubtedly of venous origin, as many of the thin-walled veins were observed in the clot on histologic examination.

The presence of calcium in an intracerebral hematoma (Case 4) has been previously observed.[32] Grantham and Smolik[20] stated in 1942 that only two such cases were reported in the medical literature.

Hamby[23] and Browder and Turney,[6] in discussing the disposition of the intracerebral blood in hemorrhage, reported that in necropsy of patients who died a few hours after the hemorrhage occurred, clotted blood was found, but that in those who survived 12 to 15 hours the intracerebral blood had become syrupy and suitable for aspiration.

As to the indications for surgical intervention in cases of cerebral vascular accidents, Gurdjian[22] observed: "In acute hemorrhagic conditions, the one important symptom justifying exploration is increasing drowsiness or stupor." Craig and Lipscomb[13] stated that in all cases of expanding lesions of the brain, operation should be considered not only to relieve the symptoms but to establish a diagnosis. Meridith[36] expressed the opinion that "No patient, however moribund, should be denied the benefit of at least a limited procedure—as often a surprisingly happy solution will be encountered which is undoubtedly life saving to the patient and of considerable satisfaction to all those concerned with the case." Hamby[23] expressed belief that operation should be considered for patients with apoplectic or with gradual onset of symptoms, with progression of the signs and symptoms and development of signs of increasing intracranial pressure. Penfield,[38] in summarizing a report of cases observed by him, felt that had he been more prompt in giving surgical aid, the life of one patient could have been saved and residual hemiparesis that occurred in a 14-year-old boy could have been prevented.

The authors believe that at least an angiogram and at least a limited surgical procedure as a step toward diagnosis and a more positive approach toward the saving of life is warranted for patients who survive the shock of hemorrhage yet show no evidence of improvement.

490 Post Street.

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Carcinoma of the Cervix

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SUMMARY

Studies by eminent surgeons to reevaluate the place of radical operations in the treatment of carcinoma of the cervix—now that extensive procedures have become less hazardous—apparently have led to confusion in some minds as to choice between surgical and radiation therapy. Pending outcome of the studies, general employment of surgical treatment is unwarranted. Radiation is the treatment of choice in most cases, particularly if the lesion is in an early stage, although radical operation is indicated in certain rare early cases in which delivery of an effective dose of radiation to involved areas is technically difficult. Elsewise it appears at present that operation should be used only in cases of stages III or IV carcinoma—in which results by either means of treatment are poor.

One hundred and seven patients were treated with a combination of x-ray and radium irradiation. X-ray was used first to reduce the hazard of implanting the radium. The "five-year arrest" rates were as follows: For 22 patients with stage I lesion, 70 per cent; for 31 with stage II, 55.7 per cent; 33 with stage III, 39.7 per cent; 21 with stage IV, 0. Eighteen patients with diagnosis of carcinoma of the cervix who had had subtotal hysterectomy were treated. The stage of the disease could not be determined. In this group the five-year arrest rate was 52 per cent.

A GREAT deal of confusion seems to have arisen as to the proper therapy of carcinoma of the cervix — confusion regarding choice between surgical treatment and radiation.

Improvement in surgical techniques, the advent of antibiotics and chemotherapy and the general use of plasma and whole blood transfusions have made extensive operations less hazardous than they were when radical surgical procedures for carcinoma of the cervix were introduced 30 years ago. In light of these advances there is today an honest and noteworthy attempt being made by certain outstanding surgeons in this country to reevaluate the role operation should play in the treatment of this disease.

Unfortunately, the mere fact that the question is being explored by surgeons of high repute appears to have led to unwarranted widespread increase in resort to operation. For this reason it should be stressed that even radical surgical therapy ought not be generally employed until the conclusions of the current studies in reevaluation are firmly established. Surgical procedures less than radical, of course, will produce no more cures than they did 30 years ago.

Meanwhile the techniques for treatment of carcinoma of the cervix by radiation have also been improved. Tissue doses and tolerances are now quite generally known. The results are fairly uniform, although clinical evaluation and interpretation of data may vary. Properly administered radiation therapy of early carcinoma of the cervix gives good results; results of cauterization or routine hysterectomy are poor. There are rare cases in which the primary lesion appears to be in an early stage and the broad ligaments seem free of disease, yet lateral pelvic or obturator nodes are palpable. Radical operation then is indicated, as it is technically difficult to deliver an effective dose of radiation to the area in which those nodes lie. On the other hand, carcinoma of the cervix without lateral pelvic wall involvement is more safely treated by adequate radiation therapy than by routine hysterectomy or by so-called radical surgical excision in most hands.

The reports of surgeons now attempting to evaluate the role of radical surgical treatment in this disease almost routinely agree that it should be limited to thin, highly selected patients in whom the lesion is at a very early stage. Somewhat at variance is the authors' belief that early carcinoma should be treated with radiation because of the known good results, and that radical operation should be tried in cases of stage III or IV carcinoma with extensive local disease or lateral pelvic wall involvement, in which the results by either method are admittedly poor. The procedure advocated by Brunschwig in which the bladder, rectum and practically all pelvic structures are removed may be worth while in some advanced cases.

Radium is readily usable in treatment of carcinoma of the cervix because it can be placed in close proximity to the lesion and because the cervix tolerates radium therapy well. Radium properly applied to the cervix will control the primary lesion in most instances, but will not deliver an effective dose to a tumor located at a distance greater than 3 to 4 centimeters from the cervical canal. Therefore, external irradiation must be relied upon for adequate treatment of parametrial and outlying tumor-bearing regions. Patients would not be able to tolerate the amount of roentgen radiation required to deliver to the parametrial regions the same doses as are obtained throughout most of the pri-

TABLE 1.—*Results of Combined X-ray and Radium Treatment of Patients with Carcinoma in Stages I, II and III, and for Hysterectomized Patients with Stage of Disease Unknown.*

Results Five Years After Diagnosis	Mathematical Symbol	Stage I	Stage II	Stage III	Hysterectomized Patients, Stage of Decrease Unknown
All cases diagnosed	T	22	31	33	18
Died within 5 years	D	2	6	13	3
Alive with cancer at end of 5 years	W	1	2	2	0
Alive, free of cancer at end of 5 years	F	14	16	12	9
Alive, condition unknown at end of 5 years	U	0	0		0
Not traced for 5 years	N	5	7	6	6
Percentage arrested $\frac{F}{T} \times 100$		63.6%	49.3%	36.4%	50%
Percentage unknown $\frac{UN}{T} \times 100$		22.7%	22.6%	18.1%	33.3%
Expected deaths	E	2.05	2.29	2.76	.70
Expected survivors (T—E)	t	20	28.71	30.24	17.3
Adjusted percentage arrested $\frac{F}{t} \times 100$		70%	53.7%	39.7%	52.0%

mary lesions by radium applied to the cervix. However, by combining the two, the total volume of tissue receiving an effective dose is increased. The authors believe that x-ray therapy should precede the insertion of radium because it reduces the tumor mass and associated infection. The presence of a large infected or necrotic mass makes the insertion of radium hazardous, since instrumentation and the packing necessary to maintain the radium in position frequently exacerbate the condition. Furthermore, preliminary x-ray therapy greatly reduces the size of the tumor, so that the radium, when inserted, is nearer the residual carcinoma.

Combined x-ray and radium was used by the authors in treating 107 patients. In all cases x-ray therapy preceded the introduction of the radium. The adjusted five-year arrest rates in stages I, II and III of the disease are shown in Table 1. Some of the patients with stage IV carcinoma were treated for arrest, some for palliation only. The results are shown on Table 2. Eighteen additional patients with a diagnosis of carcinoma of the cervix, who had had subtotal hysterectomies, were treated by the same procedure. In this group, the stage of disease could not be determined. The results in this group (Table 1) were about the same as the composite result for the rest of the patients, taking all stages together.

TABLE 2.—*Results of Combined X-ray and Radium Treatment of Patients with Stage IV Carcinoma. Some Treated for Palliation Only.*

Results Five Years After Diagnosis	Mathematical Symbol	Total all Cases Diagnosed	Treated for Arrest	Treated for Palliation Only
All cases diagnosed	T	21	13	8
Died within 5 years	D	19	12	7
Alive with cancer at end of 5 years	W	1	1	0
Alive, free of cancer at end of 5 years	F	0	0	0
Alive, condition unknown at end of 5 years	U			
Not traced for 5 years	N	1	0	1
Percentage arrested $\frac{F}{T} \times 100$		0%	0%	0%
Percentage unknown $\frac{UN}{T} \times 100$		4.8%	0%	12.5%
Expected deaths	E	2.1	1.02	1.08
Expected survivors (T—E)	t	18.9	11.98	7
Adjusted percentage arrested $\frac{F}{t} \times 100$		0%	0%	0%

TABLE 3.—*Combined Results of X-ray and Radium Treatment of Carcinoma, All Stages*

Results Five Years After Diagnosis	Mathematical Symbol	Total all Cases Diagnosed	Treated for Arrest	Treated for Palliation Only
All cases diagnosed	T	125	117	8
Died within 5 years	D	43	36	7
Alive with cancer at end of 5 years	W	6	6	0
Alive, free of cancer at end of 5 years	F	51	51	0
Alive, condition unknown at end of 5 years	U	0	0	0
Not traced for 5 years	N	25	24	1
Percentage arrested $\frac{F}{T} \times 100$		40.8%	43.6%	0%
Percentage unknown $\frac{UN}{T} \times 100$		20%	20.5%	12.5%
Expected deaths	E	9.9	8.82	1.08
Expected survivors (T—E)	t	115.1	108.2	6.0
Adjusted percentage arrested $\frac{F}{t} \times 100$		44.3%	47.2%	0%

Table 3 gives the over-all corrected five-year cure rate for all patients treated.

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Hematologic Features Which May Influence Rh Immunization

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SUMMARY

The biologic features which may influence Rh sensitization in the mother and hemolytic disease in the newborn are conditioned by the hereditary immunologic pattern of the subjects, the antigenic characteristic of the blood group specific substances, the character of the antibody responses, the inherent susceptibility to disease as a result of the immune mechanism, and the character and sequence of exposure to the antigenic substance. In respect to Rh-negative women, there appears to be a greater vulnerability to immunization among those of blood group A. In regard to the infant, the compatibility of the maternal-infant blood types and the part they play in the phenomenon of the competition of antigens may influence the occurrence of hemolytic disease in the newborn.

THE processes of immunization which may result in the prevention of disease have in some instances been found to induce disease. A person who has developed immune bodies to the Rh or Hr factors may subsequently bear a child with hemolytic disease of the newborn, or may have a transfusion reaction in the event of exposure to blood containing the factor responsible for the sensitization.

In order for Rh immunization to occur during pregnancy, the blood of the mother must *lack* the specific Rh factor present in the fetal erythrocytes. The presence of this combination, however, is not the sole determining factor in the production of Rh antibodies. A few mothers may develop Rh antibodies during the first Rh-positive pregnancy, some in the second Rh-positive pregnancy, and some may have several Rh-positive babies and neither have demonstrable Rh antibodies nor produce afflicted infants. Among those women who *do* form antibodies and *bear afflicted children*, wide variations occur in the amounts of Rh antibodies they produce —some develop a high titer whereas others may have a persistently low titer. It may be seen, therefore, that in addition to the presence of Rh incompatibility between mother and child, other factors will determine sensitization in the Rh-negative woman.

Since it is possible for a disease to occur as a result of immunization, it is important to investigate those biologic features which may influence the character of the immune response, such as the part played by the reticuloendothelial and lymphoid systems, the hereditary features of the blood type and its characteristics, and the individual immunologic history.

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THE ROLE OF THE RETICULOENDOTHELIAL AND LYMPHOID TISSUES

The reticuloendothelial system may be defined as a group of cells having endothelial and reticular attributes and showing a common phagocytic behavior toward dyestuffs. The cells of the reticuloendothelial system were classified by Aschoff[1] into local histiocytes (sessile macrophages) and migrating histiocytes (wandering macrophages). The local histiocytes are divided into two groups: (1) The less active reticular cells of spleen, lymph nodes, the lymphatic tissues, and thymus, and (2) the very active endothelium of liver capillaries (Kupffer cells), spleen sinuses, lymph sinuses, marrow sinuses, adrenal and hypophyseal capillaries. The migrating histiocytes are divided into (1) the tissue macrophages, and (2) the blood macrophages. The part that the reticuloendothelial system plays in the immune mechanism is not entirely known, but the available evidence indicates that this system is essential to the production of antibodies. The cells of the reticuloendothelial system are widespread throughout the body. They remove foreign matter from the circulation (bacteria, protozoa, cells, and particulate matters), and they are important in the phagocytic mechanism of immunity. The tissue macrophages may store antigenic materials which may be released and carried about by wandering phagocytic cells. These materials may eventually stimulate the production of immune bodies. Reactions of the reticuloendothelial system are found to be more pronounced in instances where sensitization is induced by *repeated* infections of the blood stream.[11] Although there are many controversial points concerning the exact role of the reticuloendothelial system in immunity, it must be considered as one of the important factors influencing the immunologic response.

There is also some evidence that the lymphocyte and lymphatic tissues play a part in the elaboration of immune bodies. Harris and co-workers[4] found in the rabbit a rise in the antibody content of the lymph from an immunized lymph node, an increase in the number of lymphocytes, and a higher content of antibody in the lymphocytes than in the lymph itself following the injection of typhoid or sheep erythrocyte antigens. Such lymphocytes could be

made to yield antibody but not to absorb it. There is still some controversy over the role of the lymphocyte in antibody formation, since it has not been determined whether the large cells comprising the germinal centers of the lymph nodes are derived from reticulum cells or from altered lymphocytes.[3, 5] The reticulum cells and lymphocytic elements in the lymph nodes react quite differently toward the vital dyes and, until more conclusive proof is furnished that a relationship exists between reticulum cells and lymphocytes, they must be regarded as distinct entities.[1]

At present, the reticuloendothelial and lymphoid cells must be considered to contribute to the formation of antibodies, and apparently both tissues are involved in the immune mechanism. A person having a highly reactive reticuloendothelial system might be predisposed to a greater degree of sensitization when exposed to an antigenic stimulus.

HEREDITY

The hereditary immunologic response pattern of the individual may influence the immune mechanism and it is dependent upon (1) the status of the individual as a secretor or non-secretor, (2) the blood type, and (3) the tissue vulnerability of the individual.

1. *The secretor or non-secretor status of the individual.* The secretor character is inherited as a Mendelian dominant and it is present in 80 to 85 per cent of the white population. It divides human beings into two categories: (a) those in whom the group-specific substances (A and B) may be found in the body cells and fluids as well as in the red blood corpuscles (*secretors*), and (b) those persons in whom the group-specific substances (A and B) may be found only in the red blood corpuscles (*non-secretors*). The differences between the two are due to the nature of the specific antigenic substance; in the former it is freely diffusible, while in the latter it is found exclusively within cells. The secretor character when present is fully developed in the tissues of the newborn, whereas the blood group factor in the red blood corpuscle may be underdeveloped and weakly reactive.[6, 11, 13] This phenomenon is important in instances of Group A or B infants born to mothers who lack the A or B blood group factor in their red blood corpuscles.[8] In some instances, the mothers may develop an increase in anti-A or anti-B agglutinins which might eventually gain access to the blood stream of the child and cause hemolytic disease. The fact that hemolytic disease seldom occurs in such instances may be due to the high incidence of secretors (who absorb the agglutinin) and the fact that this feature is fully developed in the tissues at birth whereas the blood group factor (A or B) may not be fully developed in the red blood corpuscles of the newborn.

2. *The blood type.* There is some evidence to show that the blood group may be involved in the predisposition to diseases due to peculiarities in the immune mechanism. The authors have noted that the incidence of hemolytic disease of the newborn, hemolytic anemia, sickle-cell anemia, and Mediterranean anemia is a little higher in subjects with Group O blood than it is among subjects with blood of other types (Table 1). This may indicate that the Group O red blood corpuscle is more vulnerable to this type of disease process.

TABLE 1.—*The Incidence of the ABO Blood Groups in Anemias and Diseases Involving the Antigen-Antibody Mechanism*

Disease	No. of Cases	Blood Group O	A	B	AB
Mediterranean anemia	16	9	6	1	0
Hemolytic anemia	27	15	8	4	0
Hemolytic disease of the newborn	97	50	39	7	1

In instances of immunization by antigens of the red blood corpuscle (A, B, Rh, Hr, and other rarer antigens), a subject lacking many of these characteristics would have a greater opportunity of exposure to blood containing one of them during transfusion or pregnancy and thereby have a greater chance of becoming immunized.

In a study of Rh immunization, it was found that a significant correlation exists between the occurrence of Rh immunization and the ABO blood types of Rh-negative women.[9] In a series of 120 Rh-negative women who bore afflicted infants, a greater number had group A blood than would have been normally expected (Table 2).

Blood group specific substance A is found in all human beings but there is a quantitative difference in the amounts present. Some persons of Group A may vary in the content of substance A by virtue of being homozygous or heterozygous for the A factor or of harboring one or more of the various subgroups of it. Others who are not of Group A almost always have the homologous anti-A agglutinin in their sera, therefore they must have in their tissues a source of specific group A substance as antigenic stimulus. Perhaps the quality or quantity of substance A is in some way related to the responses of the individual to antigenic stimulation, but of this there is no proof.

3. *Individual tissue vulnerability.* There is evidence to indicate that the immunologic responses of the individual may be conditioned by hereditary factors.[2] It is conceivable, and there are experimental data to fortify the opinion, that tissues vulnerable to antigenic substance may react in a qualitative or quantitative manner. At least there is abundant evidence to demonstrate that great variations in the degree of response to antigenic stimuli exist. In regard to *qualitative antigenic vulnerability*, there are some persons who are relatively reactive to all antigens, some who are relatively refractory to all antigens and some who become easily immunized to certain antigens and remain refractory to others. On the other hand, *quantitative antigenic vulnerability* is measured in terms of the individual titers of antibody responses, and these may vary

TABLE 2.—*The Percentage Distribution of ABO Blood Groups in a Selected Sample of Sensitized Rh-Negative Women Compared with Those of an Unselected Obstetric Population.*

ABO Blood Group of Mother	Unselected Sample of Obstetric Patients		Sensitized Rh-Negative Women		Sensitized Rh-Negative Women According to the Clinical Condition of the Rh+ Children Born to Them			
					Hemolytic Disease		Normal	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
	1,167*	100	170	100	120	100	50	100
O		45		35		33		40
A		39		49		54		40
B		12		12		10		16
AB		4		4		3		4

* 954 $Rh_0(D)$-positive + 213 $Rh_0(D)$-negative.

TABLE 3.—*The Occurrence of ABO Compatibility* in a Group of Sensitized Rh-Negative Women Compared to the Occurrence of ABO Compatibility in a Group of Non-Sensitized Obstetrical Patients.*

	Control Group Non-sensitized		Sensitized Rh-Negative Women		Sensitized Rh-Negative Women According to the Clinical Condition of the Rh+ Children Born to Them			
					Hemolytic Disease		Normal	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Total	1,167		170		120		50	
O Total	522	100	60	100	40	100	20	100
Compatible		**70**		88		**93**		80
Incompatible		30		12		7		20
A Total	466	100	84	100	64	100	20	100
Compatible		**94**		95		**97**		90
Incompatible		6		5		3		10
B Total	136	100	20	100	12	100	8	100
Compatible		**68**		90		**100**		75
Incompatible		32		10		0		25
AB Total	43	100	6	100	4	100	2	100
Compatible		**100**		100		**100**		100
Incompatible		0		0		0		0

* ABO compatibility between mother and child exists when the child is of the same A or B blood group as the mother, or is of Group O.

from high titers, demonstrable soon after exposure, to titers which remain persistently low despite many exposures to antigenic substance. There are some persons who react vigorously with a high titer to one antigen but do not give adequate response to another.

IMMUNOLOGIC HISTORY

Previous sensitization and antigenic competition both have a direct influence on the production of antibodies. Previous sensitization with any one antigen enhances the production of antibodies in the event that a second exposure to the same antigen occurs. This has been demonstrated many times in instances of Rh sensitization. For example, an Rh-negative woman who has had, in childhood, a transfusion or an injection of Rh-positive blood, will, on a second exposure to the same antigen (that is, in pregnancy), develop Rh antibodies much more rapidly than will an Rh-negative woman whose first exposure to the antigen is the current pregnancy.

The blood plasma may contain many varieties of antibodies and if any of them are actively rising in titer, they may exhibit the competitive effect against any further antigenic stimulation, especially if the new antigen is a weak one. If an Rh-negative mother is exposed to two or more antigens simultaneously, she may form antibodies to the stronger antigen first at the expense of the weaker antigen.[7, 14] The effects of the stronger A or B antigens, when competing with the weaker Rh antigens, are shown in relation to the production of hemolytic disease of the newborn—that is, the activity of the Rh antigen appears to be correlated with a higher incidence of disease when the A or B antigen is compatible in both mother and child and therefore not in competition (Table 3).

Since the ABO compatibility between mother and child occurs frequently in the group of mothers whose infants are afflicted with hemolytic disease of the newborn, it may be assumed that perhaps the lack of interference by the stronger A or B antigens allows a greater chance for the weaker Rh antigens to act, resulting in a more vigorous degree of Rh sensitization and a higher incidence of disease.[10] Since women of Blood Group A normally have a high incidence of compatible offspring (Table 3), this may explain in part the greater number of Group A subjects among sensitized Rh negative women (Table 2).

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Malignancies of the Skin

PRECANCEROUS DERMATOSES—Samuel Ayres, Jr., M.D., *Los Angeles*

CANCER OF THE SKIN—Harry J. Templeton, M.D., *Oakland*

OTHER MALIGNANT CONDITIONS INVOLVING THE SKIN—Nelson Paul Anderson, M.D., *Los Angeles*

Precancerous Dermatoses

SAMUEL AYRES, JR., M.D., *Los Angeles*

EARLY diagnosis and prompt, effective treatment are accepted as the most important factors in the control of cancer. Since the skin is the most accessible organ of the body it is possible in many instances to recognize and destroy lesions which are potentially cancerous long before they have actually undergone malignant change.

Senile keratoses probably constitute the commonest of the precancerous lesions. They are usually found on the exposed parts of the body, such as the face and backs of the hands, and are due to a combination of three principal factors—a fair type of skin which freckles rather than tans, excessive exposure to the sun, and age. In average persons such lesions are first noticed in the age group above 50 and increase with increasing age. However, in people with very fair skins who burn and freckle rather than tan and who are excessively exposed to the sun, "senile keratoses" may develop during the third decade of life. Perhaps the term actinic keratosis would be a more accurate designation for this condition. It is believed by some that the keratosis represents an attempt on the part of the skin which lacks an adequate supply of pigment-forming cells to protect itself from ultraviolet radiation by thickening.

Having once developed, the senile keratosis usually persists indefinitely. At first the lesion consists of a barely perceptible dry, grayish, slightly rough or scaly lesion which may be detected more easily by palpation than by inspection. Such lesions usually occur on the face, nose, lower lip or backs of the hands. Patients often complain that the lesions are sensitive when rubbed or shaved over. During a period of months or sometimes many years the lesion gradually becomes larger, thicker and sometimes a little darker in color. Such lesions are usually non-inflammatory and when they do become inflamed it is often an indication that malignant changes are taking place. They may undergo malignant degeneration at any time; and when they do, they usually develop into squamous-cell epitheliomas which can metastasize.

The time to cure squamous-cell epithelioma of the skin, therefore, is in the precancerous stage, which means, first, that people with non-tanning skins should avoid heavy sunburns or excessive exposure to the sun; and, second, that every senile keratosis should be promptly dealt with. For lesions which are small (less than 0.5 cm.), superficial and non-inflammatory, the treatment of choice is freezing with solid carbon dioxide pencil, using firm pressure for 30 to 60 seconds and repeating at two-week intervals if necessary. If this is properly done, the lesions are eradicated completely with excellent cosmetic result. Lesions which are fairly thick, however, should be destroyed under procaine anesthesia by electrodesiccation and curettage to the point where curetting reveals normal tissue. If there is the slightest suspicion that malignant change has occurred, the entire lesion should be excised widely and deeply, using either the high-frequency cutting current or the scalpel, and the specimen submitted for microscopic examination. Radiotherapy properly carried out will also give satisfactory results.

Cutaneous horn or cornu cutaneum usually begins as a senile keratosis and represents an excessive hyperkeratosis. The lesion may be small and filiform or it may have a broad base and be an inch or two in length, sometimes forming a curve resembling a ram's horn. These lesions are potentially malignant and should be widely removed, preferably with the cutting current.

Chronic radiodermatitis is the name given to the changes occurring in the skin as the result of radiation injury from overexposure to x-rays or radium. This condition is definitely precancerous and exhibits all the appearances of prematurely aged skin with telangiectases, mottling due to pigmentation and depigmentation, and, in long-standing or severe cases, keratoses indistinguishable from senile keratoses and finally squamous-cell epitheliomas. Obviously proper understanding, care and precautions in the use of radiotherapy, as well as in fluoroscopic and roentgen diagnostic technique, are the most important elements in the prevention of this condition. Once the condition has developed, the involved area should be protected from excessive exposure to the sun and should be kept lubricated with a bland emollient. Incipient ulcers can sometimes be healed by the local application of the pulp of aloe vera or a vitamin A and D ointment. Keratoses should be

This trilogy was written in order to express opinions divergent from those set forth in chapters of the California Cancer Commission Studies dealing with malignant disease of the skin. The chapters were published in CALIFORNIA MEDICINE before they were assembled in book form.

destroyed by electrodesiccation and curettage, and fully developed epitheliomas should be dealt with thoroughly by surgical procedures. In some hands, the use of radon ointment has proved efficacious in the control of ulcerative lesions.

Seborrheal keratoses, seborrheal verrucae or senile warts are to be distinguished from senile or actinic keratoses. The latter usually develop on exposed areas such as the face and backs of the hands, whereas seborrheal keratoses are more liable to occur on covered areas such as the trunk and scalp although they may also occur on the face, especially along the temple areas. Seborrheal keratoses tend to occur in persons past the age of 40 or 50 who have oily skin, especially in the seborrheal areas. They are yellowish to brownish in color, have a warty-looking surface and are often covered with a greasy, mushy scale which can be easily picked or scraped off. These lesions rarely undergo malignant degeneration and if they do are more liable to develop into basal-cell epitheliomas. The seborrheal keratosis, if small or superficial, can be destroyed by freezing with solid carbon dioxide; if large, it should be treated by electrodesiccation and curettage.

Arsenical keratoses usually occur on the palms and soles but may develop elsewhere on the body. They follow the administration or accidental ingestion of inorganic arsenic in the form of Fowler's solution, probably also Asiatic pills, and contaminated drinking water such as may be found in certain mining areas. The keratoses may not develop until many years following the exposure to arsenic, but once they have developed they persist indefinitely. They may undergo malignant degeneration, usually developing into squamous-cell epitheliomas. Arsenical keratoses on the palms and soles consist of pinhead to split-pea sized corneous plugs. They are frequently associated with multiple superficial basal-cell epitheliomas on the trunk. If any of the keratoses tend to become enlarged or inflamed they should be destroyed thoroughly by means of electrosurgery.

Leukoplakia usually occurs at or past middle life in either sex but predominantly in men. It is characterized by whitish, thickened, discrete or confluent patches anywhere in the oral cavity. Local irritation from smoking, poor oral hygiene, rough teeth, dentures, or electrogalvanic currents between diverse metals in fillings, bridgework, etc., are important factors in causation. Hormonal changes, vitamin A deficiency, atrophic glossitis from vitamin B deficiency, and syphilis may be predisposing causes. Leukoplakic patches resemble senile keratoses and like the latter may degenerate into squamous-cell epitheliomas with rapid metastasis. Consequently, all thickened, indurated or ulcerated areas of leukoplakia must be subjected to biopsy. If the biopsy is negative the lesion can be destroyed by electrodesiccation and curettage, cautery, or excision. Contributing factors should be corrected. Large doses of vitamin A (150,000 units or more daily), sex hormones and vitamin B complex with dilute hydrochloric acid may be helpful in incipient cases. Leukoplakic changes may also involve the genital mucosa, especially the vulva.

Kraurosis vulvae or *atrophic vulvitis* leads to similar changes of the vulva involving both the cutaneous and the mucous tissues. The process is probably related to hormonal changes following the menopause. The condition begins with pruritus and some edema and redness, then after a period of months or years terminates in a whitish, sclerotic and atrophic condition which, if allowed to continue, frequently becomes squamous carcinoma. In early cases and sometimes even in advanced cases estrogenic hormone therapy both locally in the form of ointments or suppositories and internally may be very helpful. In cases in which the lesion is undergoing malignant change, vulvectomy is indicated.

Erythroplasia is a rare condition involving mucous membranes or mucocutaneous junction and is most commonly found on the glans penis. The lesions consist of one or more sharply circumscribed plaques with a red velvety surface and a tendency to slow peripheral extension. The danger of transformation into squamous-cell epithelioma calls for effective destructive procedures.

Bowen's disease presents a variable clinical appearance but a fairly characteristic microscopic picture. While it has been classified as precancerous, many authorities regard it as "carcinoma in situ" or early carcinomatous change within the epidermis. The lesions consist of chronic, slowly spreading plaques, patches or nodules. Thorough destruction is indicated.

Keloids, especially those following burns, lupus vulgaris, etc., have in rare instances been known to undergo malignant degeneration.

Cysts, such as sebaceous cysts, in rare cases have developed malignant tendencies.

Xeroderma pigmentosum is fortunately an uncommon condition which is congenital and familial. The person affected has a pronounced sensitivity to light, a condition which may become manifest in early infancy. Within a few years the skin undergoes senile-like changes such as a normal person would not show before the age of 70 or 80. By the age of puberty the skin is freckled, atrophic, and telangiectatic, and there are senile keratoses and epitheliomas. The lesions have to be dealt with as they arise and the patient must be protected from the sun as much as possible. The prognosis is poor and most persons who have the disease die at an early age from metastatic carcinoma.

Nevi of certain types are precancerous but do not come within the scope of this discussion and will be dealt with elsewhere in the symposium.

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Cancer of the Skin

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OF all cancers, those of the skin are most curable. Because of their accessibility for early diagnosis and treatment the cure rate, theoretically at least, should approach 100 per cent. The attainment of such perfection depends upon physicians being competent in early diagnosis, familiar with the method of treatment they plan to employ and, probably most important, sufficiently bold and radical to destroy every cancer cell at the time of the first treatment.

First in importance in the approach to skin cancer is a knowledge of the clinical appearance of the cutaneous malignancies, premalignancies and the dermatological entities which have to be differentiated. Although it is not within the province of this paper to describe all of these lesions in detail, a number of typical clinical photographs are shown here. If a physician feels that he has not had wide experience in the clinical diagnosis of skin cancer, he can still maintain a high degree of diagnostic accuracy if he depends upon a high index of suspicion and *microscopic examinations*. He should regard with suspicion all elevated and indurated lesions of the skin, particularly in elderly persons. Biopsy of such lesions is essential. Very small lesions should be removed *in toto* with a wide margin.

There is considerable difference of opinion as to the best treatment for skin cancers. Those who are highly skilled in this field develop their own methods and techniques of treatment such as electrosurgery, the actual cautery, scalpel excision, chemosurgery under microscopic control, x-ray and radium. The choice of the method to be employed will depend upon the skill of the physician and the kind of lesion to be treated. The author believes that, in general, complete removal of the lesion by means of one of the destructive methods is preferable in most cases to radiation therapy, although such therapy is indispensable in certain cases.

The various means of treatment mentioned, particularly x-ray and radium, are generally not available to most physicians who first observe patients with skin cancer. Moreover, not all physicians are acquainted with the use of these specialized forms of treatment. But this difficulty can be surmounted by recourse to a simple and satisfactory method of diagnosis and treatment available to all physicians, namely, excision with the scalpel. This procedure makes an accurate diagnosis possible and produces a very high percentage of cures if the physician is sufficiently radical at the first operation. An old rule advises that a margin of normal skin half as wide as the lesion itself be removed. A probably better one was that of Percy: "When you think you have removed a wide enough margin of normal tissue, take out some more."

Basal-Cell Epitheliomas

Squamous-Cell Epitheliomas

Melanoma

Since basal-cell epitheliomas do not metastasize to the regional lymph nodes it is never necessary to remove these nodes when dealing with this variety of epithelioma. There is some difference of opinion as to the advisability of prophylactically dissecting out clinically uninvolved lymph nodes in cases of squamous-cell epithelioma. In the author's opinion, such prophylactic node dissections should not be done in the ordinary squamous-cell epithelioma; some huge, fungating lesions might call for prophylactic node dissection. Of course, if the nodes are involved, or if there is even suspicion of their involvement, they should be removed at the time the primary lesion is removed.

There is no need to speak of different types and degrees of treatment for epitheliomas of different pathologic classification such as that of Broders. For if the rule of bold and wide removal of tissue at the initial operation is followed, all that is possible will have been accomplished, regardless of the type. And nearly all of the patients will have been cured.

3115 Webster Street.

Other Malignant Conditions Involving the Skin

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BASAL-CELL carcinomas, prickle-cell carcinomas and precancerous skin conditions occur a great deal more frequently than do some of the other malignant conditions involving the skin. Nevertheless it is important to briefly discuss a few of these relatively uncommon malignant conditions.

Malignant melanomas (melanocarcinomas, melanosarcomas) are among the most malignant of all skin tumors. In general these develop from preexisting moles. The usual pre-melanotic mole is small to large pea-sized, appears to be imbedded in the skin, is non-hairy (although there are rare exceptions) and has a slate blue, blue-black or gunmetal color.

The signs of malignant change in such a mole are (1) increase in size, (2) increase in pigmentation, (3) the development of a crust, scale or small scab on the surface and (4) slight hemorrhage. The development of similar but smaller satellite lesions in the immediate neighborhood is of grave significance in prognosis because such lesions represent extension from an original lesion which is highly malignant. The gradual but steady development of a light to moderate brown macular pigmentation which extends peripherally in one or all directions from such a lesion is another phenomenon which represents a definite intra-epidermal extension of a highly malignant process.

Although malignant melanomas may occur on any area of the body, there are certain areas of predilection. These localities are the face, the portion of the foot covered by the shoe, and the subungual regions.

There are certain lesions which at times closely simulate malignant melanomas. These include pyogenic granuloma, pigmented basal-cell epithelioma, small subcutaneous angioma, irritated but benign pigmented nevi, the so-called blue nevus of Jadassohn, deeply pigmented seborrheic keratoses, and nodular subepidermal fibroma. Old hemorrhage in a cyst, callus or scar and traumatic tatoo marks from ordinary or indelible pencils or from ink must also be considered.

In most of these conditions, differentiation may be made clinically by an experienced observer, but if that is impossible, then it is imperative that the lesion be widely and deeply excised and that the material removed be examined by a qualified pathologist. If such a lesion proves to be benign, no further therapy is indicated. If malignant melanoma is present, wide and deep removal of the original site. including the underlying fascia, is indicated.

Multiple idiopathic hemorrhagic sarcoma (Kaposi): Generally starting on the feet or ankles, this neoplastic process presents bluish-red to purple-brown pigmented nodular lesions and plaques. These lesions vary in size from that of a pea to that of a lima bean or larger and present varying degrees of infiltration. At first they are usually found about the feet and ankles, less commonly on the hands. At the onset the lesions are generally discrete and multiple but later on coalesce to form infiltrated plaques. Still later similar, firm nodules develop on other parts of the body including the face, ears and trunk. In the final stages multiple, pigmented, hemorrhagic sarcoma involves the lymphatic system as well as various viscera.

The diagnosis should be confirmed by biopsy. Accepted therapeutic procedures are radiation therapy and the administration of arsenic.

Mycosis fungoides and the lymphoblastomas: There is a not inconsiderable group of neoplastic conditions which are termed the lymphoblastomas. These include mycosis fungoides, Hodgkin's disease, lymphosarcoma and lymphatic, myelogenous and monocytic leukemia.

Such disorders may originate primarily in the skin or they may start in the internal organs and involve the skin only secondarily. There appears to be a close relationship between the various members of this group, so close at times that an exact diagnosis as to type is not always possible.

In this group cutaneous lesions develop which may be non-specific in character. These non-specific skin lesions may be either local and relatively well circumscribed, or generalized. Thus the following non-specific cutaneous reactions may be found in association with the lymphoblastomas: (1) Herpes zoster, which is seen particularly in association with Hodgkin's disease. (2) Generalized pruritus which may exist with or without excoriations or with or without lichenification or thickening of the skin. Such a generalized itching is seen most frequently in Hodgkin's disease and must be differentiated from other conditions causing more or less generalized pruritus such as diabetes, nephritis, scabies, pediculosis, liver disease and bath itch. (3)

Pigmentation of the skin. (4) Generalized exfoliative dermatitis. This condition in some instances is non-specific but in most cases presents specific histopathological changes characteristic for the particular lymphoblastoma which is present. (5) A large group of ill-defined non-specific skin changes which resemble either psoriasis or eczema. Often the conditions in this group are seen in association with mycosis fungoides. (6) Urticarial skin lesions, bullous and pemphigus-like eruptions; fleeting, constantly changing and sometimes evanescent lesions belonging in the erythema group, as well as purpuric and hemorrhagic lesions. (7) Lesions of the mucous membrane with hemorrhagic, ulcerated or necrotizing features. These are seen especially in association with the acute leukemias.

Specific cutaneous changes also occur in association with the lymphoblastomas. Thus in Hodgkin's disease may be found solitary or multiple nodules or ulcers occurring in infiltrated plaques. Rare, however, is true Hodgkin's disease of the skin.

Frequently associated with mycosis fungoides are cutaneous lesions which have characteristics readily identifiable in microscopic examination but which clinically appear as a wide variety of lesions ranging from multiple definite cutaneous tumors of varying sizes and shapes to multiple plaques presenting more or less gyrate figures and simulating psoriasis or eczema. In rare instances the lesions may be tumors from the onset (the so-called d'emblée type). In other rare instances bullous or verrucous lesions may be present. In general the histopathologic picture is characterized by cellular infiltrate in the cutis composed of many different types of cells. Along with this are found pyknosis (shrinking with necrotic changes of the nucleus) and karyorrhexis (fragmentation of the nucleus).

In the various types of leukemias which involve the skin, whether they be of lymphatic, myelogenous or monocytic type, there occur variously sized purplish to violaceous cutaneous nodules. Mucous membrane lesions frequently involve the gums and are of purpuric or hemorrhagic character. Multiple large purplish plum-colored and plum-shaped tumor masses may involve the face. In rare instances ulcerated tumors develop. In nearly all cases hematologic studies are of value and may lead the way to a correct diagnosis. In other instances pathologic studies of the cutaneous lesions may reveal the type of leukemia long before any changes in the blood are noted.

So-called lymphosarcomas include varying types of pathologic processes. While the expert pathologist rightly attempts to classify these conditions, for practical purposes this group probably represents an end stage of the various lymphoblastomas previously described—nodules, plaques, generalized exfoliative dermatitis, and ulcerated lesions—they occur both with and without evidence of hematologic changes.

The diagnosis of lymphoblastomas as to specific type often requires the cooperation of the dermatologist, the pathologist and the hematologist. Frequent blood studies including studies of the bone marrow may be necessary. Even so there will be a considerable group of cases in which no definite diagnosis as to type can be made either during the life of the patient or at autopsy.

The treatment of the various types of lymphoblastoma is very unsatisfactory. X-ray therapy, the administration of nitrogen mustard, arsenic, antimony, chaulmoogra oil, and radioactive phosphorus —all are palliative. The best that can be said for any of the present methods of treatment is that they may make the patient more comfortable. This is accomplished by the relief of the itching, and the temporary alleviation of foul-smelling necrotic and secondarily infected tumor masses. Pressure symptoms may be temporarily relieved and the growth of the tumor retarded. In general, however, it is doubtful that any patients are cured or that life is appreciably prolonged.

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CASE REPORTS

- Chronic Relapsing Q Fever: Treatment with Streptomycin, Aureomycin, and Chloramphenicol
- Progressive Muscular Dystrophy Associated with Retinitis Pigmentosa

Chronic Relapsing Q Fever: Treatment with Streptomycin Aureomycin, and Chloramphenicol

JACK SHELDON CHUDNOFF, M.D., *Los Angeles*, and ALBERT G. BOWER, M.D., *Pasadena*

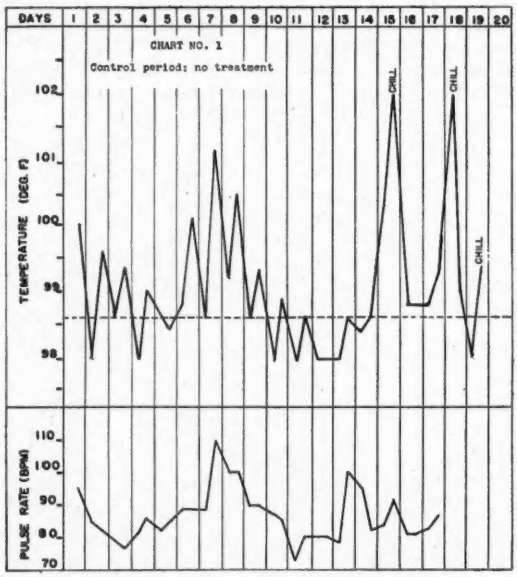
IN a review of the literature, no detailed report of chronic illness attributed to Q fever was found. There follows a description of such a case, which was studied minutely and at great length, although the record is necessarily shortened for publication. Since this case was studied, two additional less severe cases have been observed. Follow-up questionnaires of many patients seen in this area have led to the belief that prolonged asthenic states without actual chronic disease quite commonly follow attacks of acute Q fever.

CASE REPORT

A white male, 38 years of age, was admitted to the Los Angeles County General Hospital Oct. 13, 1948, with a history of recurrent episodes of "shaking chills with fever" for four days which had occurred some seven months previously. At that time, a physician had diagnosed a "flu" syndrome and prescribed a sulfa drug. After about five days, the patient had improved and was well for almost six months until Sept. 10, 1948, when the shaking chills began to recur daily. Fever recurred for more than a week, abated temporarily, then returned; it was associated with pain in the right calf and severe frontal headaches. At that time, an x-ray of the chest was normal. Agglutination tests for brucellosis were negative. The past medical history was irrelevant. The patient had gradually lost approximately 20 pounds in weight since Oct. 1947 for no apparent reason.

At physical examination upon admission, the patient was noted to be well developed and well nourished. The temperature was 100° F., the pulse rate 84 b.p.m., and the blood pressure 120 mm. of mercury systolic and 86 mm. diastolic. Small inguinal nodes were palpable, but there was no other evidence of lymph node involvement. The only other physical findings of note were a tender palpable liver, three finger-breadths below the right costal margin, and a barely palpable spleen.

The patient continued to have shaking chills each morning with fever to 100° F. The spleen gradually diminished in size. Only symptomatic treatment was given. On Nov. 12, 1948, the patient left the hospital with diagnosis not established, and without consent. Blood specimens had been sent to the National Institute of Health at Bethesda for special studies concerning Q fever, but no report had been received at the time the patient left the hospital. The patient returned to his home and soon afterward was visited by the local public health authorities because of two doubtful Kahn test reactions reported by the hospital to the local health department. During the course of the field investigation of the blood studies, reports were received from Bethesda that the complement-fixation reactions for Q fever were positive in a dilution of 1:64. Results of all other bacteriologic and serologic studies were negative.

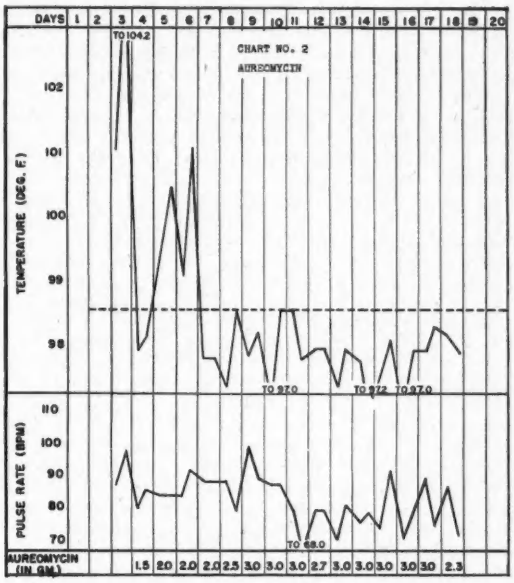


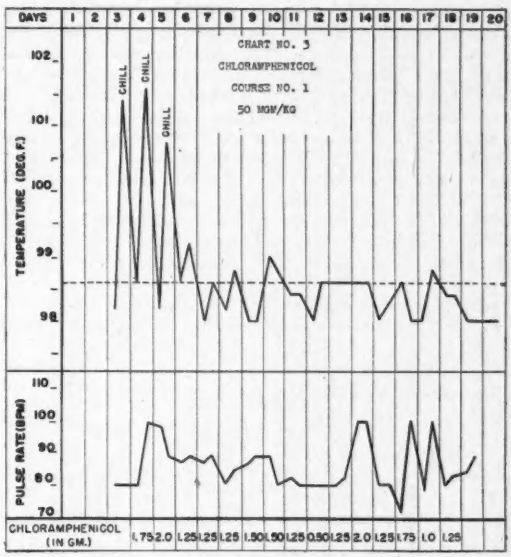
The patient was readmitted to the Communicable Disease Unit, Jan. 3, 1949, for treatment of Q fever. Since Nov. 12, 1948, he had had nightly sweats with fever of 102° to 103° F., but only two shaking chills. Chief complaints were fever, severe bitemporal headache, and generalized weakness. For a week preceding readmission there had been sharp sticking pains in the left upper quadrant of the abdomen upon deep breathing. The spleen was palpable three finger-breadths below the costal margin. On Jan. 4, 1949, an initial dose of 50 mg. of aureomycin per kilogram of body weight was given orally, followed by a total dose of 500 mg. every four hours. On Jan. 12, the aureomycin dosage was changed to 750 mg. every five hours. Approximately 72 hours after antibiotic therapy was started, the fever subsided and the temperature remained normal until the patient was discharged on Jan. 19, 1949. Prior to discharge, results of Kahn and Wassermann tests of the blood were again reported as doubtful. The albumin-globulin ratio was 3.8:5.3 gm. per 100 cc.

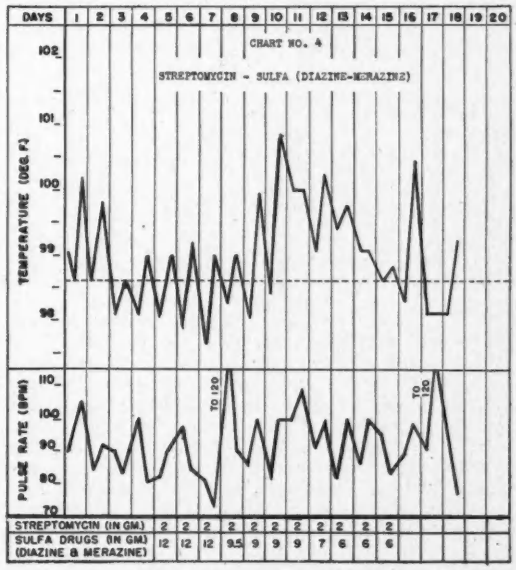
Q-fever complement-fixation titre was reported positive in dilution of 1:134 by the Los Angeles City Health Department and also by the California State Department of Public Health.

At the time of discharge the patient was clinically improved but there was evidence of residual hepatitis. After

From the University of Southern California School of Medicine, and the Communicable Disease Unit of the Los Angeles County General Hospital.




DAYS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
CHART NO. 3
CHLORAMPHENICOL
COURSE NO. 1
50 MGM/KG
CHILL
CHILL
CHILL
TEMPERATURE (DEG. F.)
PULSE RATE (BPM)
CHLORAMPHENICOL (IN GM.)
1.75 2.0 1.25 1.25 1.25 1.50 1.50 1.25 0.50 1.25 2.0 1.25 1.75 1.0 1.25


DAYS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
CHART NO. 4
STREPTOMYCIN - SULFA (DIAZINE-MERAZINE)
TO 120
TO 120
TEMPERATURE (DEG. F.)
PULSE RATE (BPM)
STREPTOMYCIN (IN GM.) 2 2 2 2 2 2 2 2 2 2
SULFA DRUGS (IN GM.) (DIAZINE & MERAZINE) 12 12 12 9.5 9 9 7 6 6 6

an interval of about two weeks, malaise and occasional backaches developed. At least every other night the temperature reached 101° F., accompanied by severe bitemporal headache. Feb. 9, 1949, the patient had a chill, the first shaking since returning home. He immediately reentered the hospital.

The spleen and liver were palpable approximately three finger-breadths below the costal margins. Because the relapsing course strongly suggested brucellosis, despite completely negative results of laboratory studies, it was decided this time to institute therapy with streptomycin and sulfadiazine. The patient received 1 gm. of streptomycin intramuscularly twice daily, and equal parts of sulfadiazine-sulfamerazine orally (initial dose 4 gm. followed by 1 gm. every four hours) for 11 days. The patient became afebrile in 48 hours, remained so two days, and then the temperature began to rise. Care was taken to maintain adequate concentration of the sulfa drugs in the blood. However, by the tenth day of treatment, fever rose to 101° F. and this treatment was discontinued.

At this time, chloramphenicol* became available for trial, and an initial dose of 50 mg. per kilogram of body weight was divided into three parts which were given in hourly doses. Following these doses, a daily total dosage of 50 mg. per kilogram was given, divided into equal portions on a two-hour schedule around the clock. After the patient became afebrile for 24 hours, the total 24-hour dosage remained on the basis of 50 mg. per kilogram, but was then given every four hours around the clock for an additional 14 days following the first afebrile day. Within 12 hours after the initial dose of chloramphenicol the patient volunteered that he felt very good, but 72 hours elapsed before he became afebrile. Fever did not recur. The patient remained asymptomatic from March 18 through April 1 when he was discharged to his home.

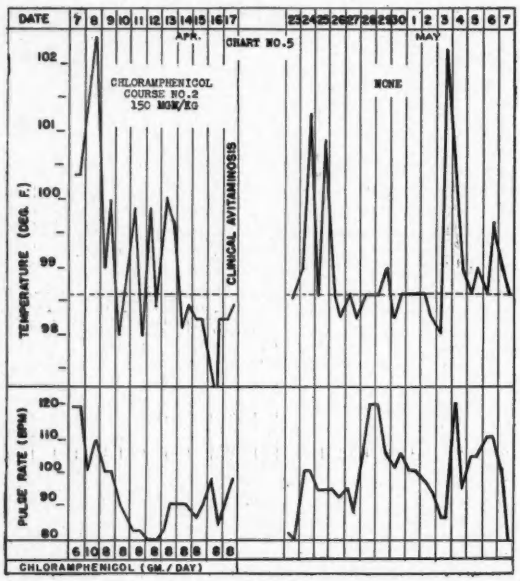
Again, the laboratory reported the results of repeated blood cell counts and urinalyses to be within normal limits. Repeated malaria studies, x-ray films of the chest, blood chemistry determinations, and numerous agglutination tests were non-contributory. The results of Kahn tests, however, were reported as doubtful on two occasions. Three hematocrit determinations showed packed red cells at 40, 37, and 38 per cent of the whole blood. Successive determinations showed albumin-globulin ratios of 3.7:4.3 and 4.1:5.5 gm. per 100 cc., respectively; the icteric index on three occasions never exceeded 10 units; thymol turbidity was 13 units, and the cephalin-cholesterol flocculation was 2 plus in 24 hours. Complement-fixation titres for Q fever were positive in dilutions of 1:520 (March 1), 1:1,032 (March 15), and 1:4,096 (March 31). The determinations were performed by the Los Angeles City Health Department with confirmatory specimens sent to the United States Public Health Service at Bethesda, Md.

During a week at home, the patient daily had fever to 103° F. with profuse nocturnal sweats and shaking chills. He reentered the hospital April 7 for the fourth time with

*The drug was made available by E. C. Von derHeide, M.D., of the Clinical Research Division of Parke, Davis & Co., of Detroit, Michigan.

temperature 100.4° F., pulse rate 120, and respirations 30 per minute. Splenomegaly, hepatomegaly, and a moderate degree of tinea cruris were present. The exanthem in the crural area had been present several weeks before and was now exudative. It was not given unusual consideration.

In view of the previous response, it was decided to use chloramphenicol again, this time in massive dosage on the supposition that previous amounts might have been inadequate and merely suppressive. The staff was not satisfied that the final diagnosis was completely established in this case, and the patient was completely restudied from a laboratory standpoint to ascertain if other entities were present in addition to the indisputable Q fever.



On April 7, an initial dose of 150 mg. of chloramphenicol per kilogram of body weight was divided into three parts and given with one-hour intervals. This was followed by 1 gm. every three hours for the ensuing 14 days. In 72 hours, the patient was subjectively well and completely afebrile. He noted light-headedness, not severe, and a very bitter taste in his mouth. The crural eruption was progressing unfavorably and was annoying. On April 11, prothrombin time (ascertained preparatory to peritoneoscopic visualization) was 49 per cent of normal (normal, 12 seconds). Vitamin K was administered intramuscularly in doses of 10 mg. three times daily. On April 17 there was a generalized, weeping, maculopapular, erythematous eruption, especially pronounced over the forehead, face and thorax; the tongue was beefy red; perleche was present; there was increased conjunctival vascularity and a necklace of erythema of the pellagrinous type. Severe multiple vitamin deficiency was obvious. Dermatologic consultation confirmed this diagnosis on April 20, and the patient was given heavy parenteral dosage of multiple-vitamin preparations. Local applications used until this time had been ineffectual and were stopped. Chloramphenicol was discontinued April 18, following the diagnosis of avitaminosis. After Vitamin K therapy for eight days, prothrombin time was 65 per cent of normal (normal, 14 seconds). Result of a simultaneous cephalin flocculation test was 1 plus in 24 and in 48 hours. The albumin-globulin ratio was reported as 4.1:4.8 gm. per 100 cc. The dermatitis responded rapidly to vitamin therapy parenterally. On April 28, 1949, peritoneoscopic examination was carried out and a biopsy specimen taken from the liver. The postoperative diagnosis based on a macroscopic visualization was hepatitis and subacute splenomegaly. Observations in microscopic examination of tissue sections were reported consistent with "mild cirrhosis, Laennec's type." Because there was still a question of differential diagnosis, especially regarding multiple myeloma or reticuloendotheliosis, serum protein studies by electrophoretic analysis were obtained, with the following report:

	Value (in %)	Normal (in %)
Albumin	30	55–60
Alpha globulin	15	15
Beta globulin	14	14
Gamma globulin	41	12

There was no pattern report which would strongly indicate any specific entity known. Extensive laboratory and roentgenologic data were again non-contributory with the exception of complement-fixation titres positive for Q fever. Complement-fixation titres had progressed to 1:4,096 (May 19), and to 1:16,384 (June 2, 1949).

After seven days of intensive chloramphenicol treatment, the patient was afebrile and felt well, although he had fever of 101° F. on the tenth and eleventh days after the drug was discontinued. Because the dermatitis remained, there was reluctance to resume therapy with any antibiotic which might suppress bacterial action in the intestines. The patient became apprehensive with the return of febrile episodes. Therefore, one of the members of the staff who was investigating the effects of ultraviolet hemo-irradiation by the Knott technique requested permission to treat him by this method. Accordingly, on May 15, 17, and 20, approximately 200 cc. of the patient's own blood was withdrawn, irradiated by the Knott technique and replaced. There was notable euphoria after each treatment. The patient had one sharp episode of fever to 102.4° F. on May 20, but thereafter remained afebrile. The effect of the hemo-irradiation remains a matter of conjecture. The patient was discharged from the hospital May 27, 1949, for follow-up care in the out-patient department. The final discharge diagnoses were:

1. Chronic relapsing Q fever.
2. Hepatitis (cirrhosis of the liver, mild, Laennec's type?)

At about the time the patient was discharged, a belated report was received of agglutination studies done for brucellosis by special technique which included not only removal of the blocking antibodies, but agglutination separately against B. abortus, B. melitensis, and B. suis. The results reported were: For B. abortus, positive in dilutions 1:20 through 1:160, weakly positive in 1:320, negative in 1:640; for B. melitensis, negative in all dilutions; for B. suis, negative in all dilutions.

DISCUSSION

The diagnosis of Q fever was not established during the first hospitalization of the patient, but it was suspected and the resultant positive complement-fixation report from the U.S.P.H.S. established it and indicated rehospitalization for further study and treatment. The second admission was for treatment only, and there was then no suspicion that the case was unusual in any way. By the third admission, Feb. 10, 1949, through April 1, 1949, the bizarre clinical course threw doubt upon the diagnosis, and the patient was subjected to the full scope of diagnostic and therapeutic procedures available. In spite of all efforts to uncover other causes for the illness, the only consistent finding remained a complement-fixation reaction positive for Q fever with a steadily rising titre to 1:16,384 (four plus in the final tube). This titre might have been even higher had the relatively more sensitive Italian antigen been used. While it is known that the complement fixation titre rises in most if not all cases of Q fever during convalescence, the clinical course

of this patient was not that of convalescence, but rather of repeated febrile relapses with each clinical relapse characterized by signs and symptoms usually associated with an initial attack.

Since the diagnosis of Q fever is unequivocally one of laboratory procedures alone, it was necessary to exclude other entities by extensive and repeated determinations. It was also necessary to contrast the clinical course of this illness with those of other entities in order to eliminate conditions for which there are no pathognomonic laboratory findings. If these criteria could be satisfied, the unique diagnosis of chronic relapsing Q fever could be substantiated.

The laboratory findings in clinical Q fever ordinarily revolve about two findings, viz.: pneumonitis and positive complement-fixation titres. In this case, there was at no time clinical or roentgenologic evidence of pneumonitis although x-ray films of the chest were taken six different times. The progress of the complement fixation titres is shown in Figure 6. Erythrocyte and leukocyte counts are usually within normal limits in the presence of Q fever, and they were in this case. Sedimentation rates, electrocardiograms, and cultures of the blood, stools, and urine were not of diagnostic significance. Spicknall[7] reported Coxiella organisms recovered in five of 45 attempts in other cases. In this case, attempts to recover the organism were not made until the fourth admission, and at that time inoculation into animals was unsuccessful. There are no reports of a positive reaction to a Kahn test in Q fever, but it is known that false positives or doubtful reactions may be associated with hepatitis, which was present in this case.

It is of interest to note the low positive agglutination titres obtained during the fourth hospital admission for Brucella abortus. This is in keeping with recent observations by Meyer and Eddie.[5]

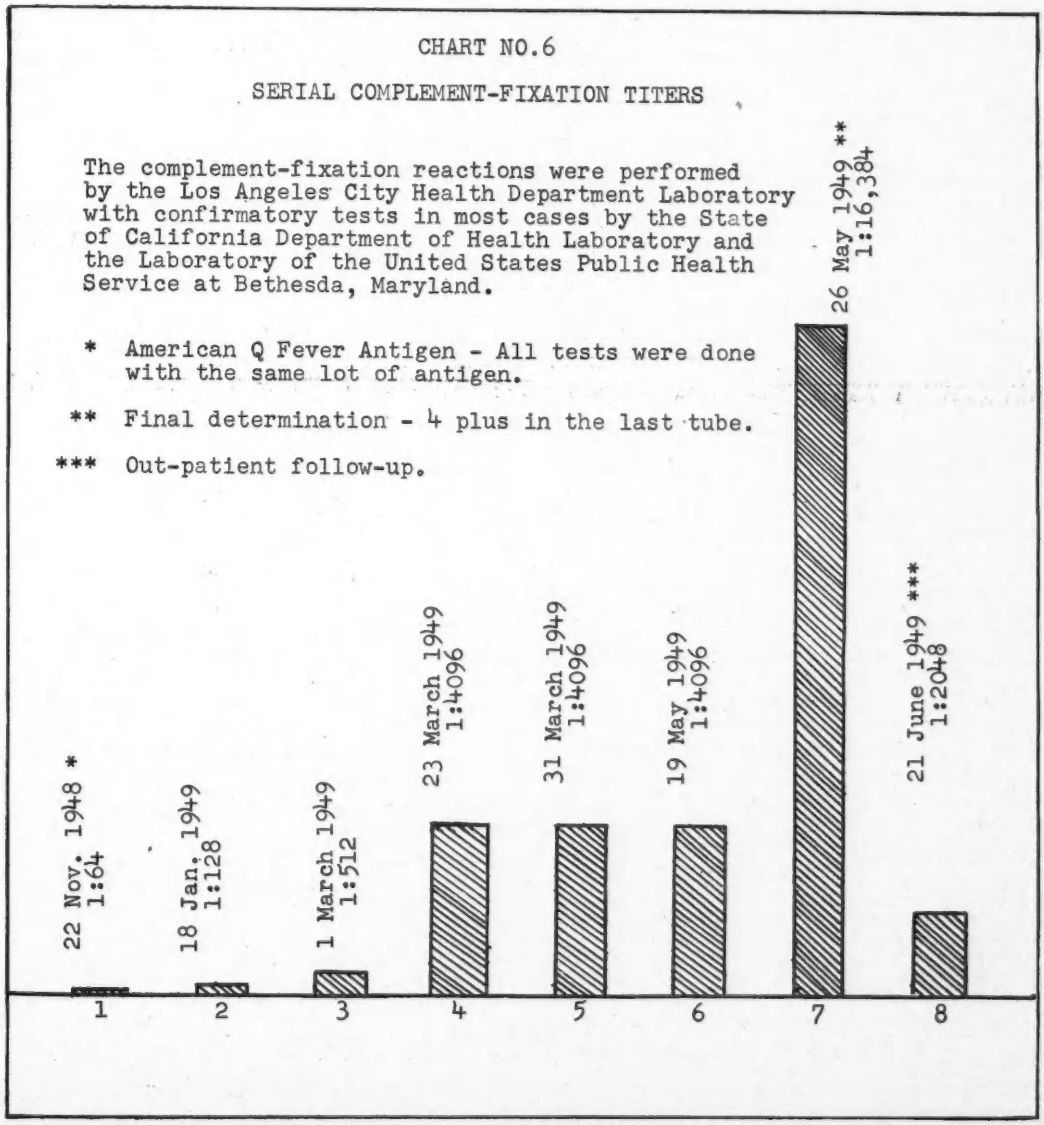


CHART NO.6
SERIAL COMPLEMENT-FIXATION TITERS
The complement-fixation reactions were performed by the Los Angeles City Health Department Laboratory with confirmatory tests in most cases by the State of California Department of Health Laboratory and the Laboratory of the United States Public Health Service at Bethesda, Maryland.
* American Q Fever Antigen - All tests were done with the same lot of antigen.
** Final determination - 4 plus in the last tube.
*** Out-patient follow-up.
22 Nov. 1948 * 1:64
18 Jan. 1949 1:128
1 March 1949 1:512
23 March 1949 1:4096
31 March 1949 1:4096
19 May 1949 1:4096
26 May 1949 ** 1:16,384
21 June 1949 *** 1:2048
1
2
3
4
5
6
7
8

The experience with antibiotic therapy was indeed unusual in that the patient appeared clinically to make a good response each time, only to relapse after therapy was stopped. Invariably, under each method of administration the patient became afebrile after 48 to 72 hours of treatment. Subjectively, improvement began even more quickly. In fact, there was virtually euphoria after chloramphenicol was started each time. When the second course of chloramphenicol was instituted with massive dosage, the patient complained of an extremely bitter taste, which can be explained by the fact that this antibiotic is excreted in the saliva within one and a half hours after ingestion.

The development of the classical skin manifestations of avitaminosis, plus the depression of the prothrombin time was not anticipated and, in fact, not recognized early. These occurrences are of much significance. It is apparent that when agents are used which tend to sterilize the bacterial flora of the gastrointestinal tract over prolonged periods, it may be necessary to supplement the treatment with vitamin therapy. In this case, rapid clinical improvement of all general and superficial avitaminotic manifestations occurred when such specific therapy was given.

After the third admission, on Feb. 10, 1949, intensive search was made to determine if more than one disease entity was present. It was known that the patient had hepatitis, but whether this represented a complication of Q fever or was an independent entity, was not known. The patient had never received plasma or blood prior to the present illness. There was never any visible icterus, but the liver and spleen were larger than normal and increased perceptibly in size with each severe febrile relapse. The differential diagnosis and the considerations therein are presented in Table 2.

In all probability, the clinical entity of Q fever has not yet been described in all of its possible variations. The criteria for diagnosis cited by pioneer clinical investigators in this country up to the present are:[1]

1. A four-fold or greater rise in the titre in successive blood specimens during convalescence is considered absolutely diagnostic of Q fever.

2. A single titre of 1:32 or greater during convalescence from an acute febrile illness of a nature clinically compatible with Q fever is considered strongly presumptive of the disease.

In the case here reported, both criteria were met.

The original description of the Australian cases was characterized strikingly by the absence of pneumonitis.[3] It has been present rather consistently in American cases—in 13 of 45 cases of one series,[7] and in 50 of 80 cases in a second series.[1] Absence of pneumonitis, therefore, is not unusual. Its presence, however, is most helpful in suggesting the diagnosis during the initial phases of an illness.

The average incubation period reported is 16 to 18 days, with a range of 13 to 32 days. Although the patient in the case here reported dated the onset of illness to March 1948, it appears more likely that the actual infection occurred

TABLE 1.

Signs and Symptoms Reported in Q Fever from Literature

Symptoms:	(Series of 45 cases[7])	(Series of 80 Cases[1])	Signs and Symptoms in Patient
1. Headache	34	not tabulated	1. Present. With each febrile relapse.
2. Generalized aching	20	10	2. "Flu-like" aching with each relapse.
Arthralgia	0	5	
3. Cough	15	50	3. Absent.
4. Chest pain or discomfort	12	29	4. Absent.
5. Nausea or vomiting	10	26	5. Nausea with each relapse; vomited once.
6. Anorexia	not tabulated	42	6. Present.
7. Burning of eyes	6	3	7. Absent.
8. Bloody sputum	5	not tabulated	8. Absent.
9. Abdominal pain	3	4	9. Epigastric and left upper quadrant pain present.
10. Diarrhea	2	4	10. Absent.
11. Constipation	2	not tabulated	11. Present.
12. Epistaxis	2	not tabulated	12. Absent.
13. Sensitivity of skin	1	4	13. Erythema of forehead and neck with febrile relapses. Tinea cruris.
14. Other	0	0	14. Pain in right calf, second admission.
Signs:			
1. Chills or chilly sensations. Sweats	32	67	1. Bed-shaking chills with febrile episodes.
2. Rales	11	47	2. Absent.
3. Fever without chills or sweats	10	(Fevers 80)	3. Fever with chills and sweats.
4. Abnormal breath sounds in chest	5	21	4. Absent.
5. Conjunctivitis	5	6	5. Absent.
6. Dullness on percussion	4	21	6. Absent.
7. Incr. vocal fremitus	4	not tabulated	7. Absent.
8. Dyspnea	3	not tabulated	8. Absent.
9. Cyanosis	2	not tabulated	9. Absent.
10. Delirium	2	13	10. Absent.
11. Rash	1	4	11. Erythema of face and forehead with fever.
12. Incontinence	1	not tabulated	12. Absent.
13. Palpable liver	not tabulated	3	13. Present.
14. Palpable spleen	not tabulated	2	14. Spleen definitely enlarged.
15. Lymphadenopathy	not tabulated	13	15. Absent.
16. Meningeal irritation	not tabulated	20	16. Absent.

approximately Sept. 10, 1948. At that time, the acute phase began, recurring periodically throughout four periods of hospitalization. The complement-fixation titres increased progressively. The initial positive complement-fixation titre was obtained shortly after the first hospital admission. The usual duration of illness or infection before the appearance of a positive titre is 10 to 14 days.[3]

Six cases in which the patients had relapse following apparent recovery from Q fever have been reported.[2, 4] Heubner and co-workers[3] mentioned a case in which there was complete repetition of the clinical course after a five-day course of treatment with streptomycin. Derrick and Burnet[4] reported one case in which there was a daily rise in temperature for nine weeks after onset of Q fever. The course of illness in that case was approximately nine months.

Sequelae of phlebothrombosis, pains in the legs, edema in the ankles, persisting hiccups, and peripheral claudication have been reported in the literature and have been observed by the authors. The presence of hepatitis as a complication or sequel has not been reported previously.

According to Huebner, significantly high complement-fixation titres have been obtained as long as six years after recovery. In the case here reported, the titre continued to rise progressively with each relapse. With the exceptions of Rocky Mountain spotted fever and brucellosis,[5] no human illnesses have been found to produce serum components capable of giving a positive reaction in the Q fever complement-fixation test.

In the treatment of Q fever, sulfonamides and penicillin have been used singly and in combination, with no perceptible effect. Streptomycin has been reported of value in experimentally induced infections and in isolated clinical instances.[6] Aureomycin is of benefit in human infections.[4] Para-aminobenzoic acid in adequate doses was of no benefit in three reported cases.[1] To the present, there are no reports available concerning the use of chloramphenicol in Q fever. At the time it became available, there was no information concerning optimal dosage and the procedure employed was of a pioneering nature, guided only by clinical judgment and by the information from the manufacturer, who suggested that the dosage originally employed in the pilot studies on scrub typhus be used.

In spite of the fact that the patient remained febrile, a noteworthy feature was the pronounced change in attitude and the feeling of well-being within 24 hours after this antibiotic was given. This euphoric state, however, also occurred when aureomycin was given. Following the relapse after the initial treatment with chloramphenicol, it was decided to use it in massive dosage to rule out inadequate therapy. The second time, the patient noted light-headedness at once, but it was not troublesome enough to warrant discontinuing the therapy. He complained increasingly of a bitter taste which precluded enjoyment of food or drink.

It was midway during this intended 14-day course of treatment that the dermatologic aspects of severe avitaminosis became evident, and for that reason all therapy was stopped. In retrospect, it must be pointed out that following the second hospital admission on Jan. 3, 1949, the patient intermittently received many successive therapeutic agents which are known to sterilize the bacterial content of the gastrointestinal tract. By April 17, 1949, after more than three months of such therapy, avitaminosis was clinically apparent, although the patient was eating an average amount of the usual hospital diet. Unfortunately, the only laboratory determinations—assays, in a sense—which were made to corroborate avitaminosis were the prothrombin-time determinations. That there was associated hepatitis either complicating the Q fever or concomitant with it is unequivocal. It is felt, nevertheless, that the prothrombin time depression was affected by the additional factor of avitaminosis secondary to gastrointestinal bacterial sterilization.

It would appear from this experience that at least two important facts concerning chloramphenicol were brought into clinical focus: The antibiotic is low in toxicity for humans and can be given in relatively large doses comparatively safely; it is wise when chloramphenicol or other similar agents are being administered to use supplements of multiple vitamins especially if therapy is prolonged.

There are at present insufficient autopsy data regarding Q fever to ascertain the anatomical site of Coxiella localization. Despite apparent response to therapy in this case, it is equally apparent that auto-immune mechanisms very probably are required for the eventual suppression. The steady progressive rise in complement-fixation titres is supportive of such a conclusion. Unquestionably, judging by the fever charts, antibiotics can be suppressive and, in many cases, even curative. The latter alternative has been the sole idea

TABLE 2.—*Chronic Relapsing Q Fever*

Conditions Considered in the Differential Diagnosis	Observations and Procedures Used to Include or Exclude This Diagnosis During Four Hospital Admissions:
1. Influenza	1. Length of febrile illness. Serology not attempted.
2. Sinusitis	2. Two series of sinus x-rays. ENT consultations.
3. Malaria	3. Fifteen series of blood smears in all phases of fever. Epinephrine test.
4. Rheumatic fever	4. Two electrocardiograms; 3 sedimentation rates. Clinical picture.
5. Typhus fever	5. Agglutination for OX-19 four times.
6. Brucellosis	6. Blood cultures under special condition, 8; agglutination studies, including those with removal of blocking antibodies, 8.
7. Typhoid fever	7. Blood cultures, 8; stool cultures, 4; urine cultures, 2; agglutination, 6.
8. Psittacosis	8. Complement-fixation, 1. Clinical course.
9. Tuberculosis	9. Skin test positive; chest x-rays, 6.
10. Coccidiomycosis	10. Skin tests, 2—both positive; complement-fixations, 3—all negative.
11. Histoplasmosis	11. Skin tests, 2—both negative.
12. Multiple myeloma	12. Urinalysis, 32; bone marrow studies, 2; body x-rays, 1 complete series. Electrophoretic analysis of serum proteins.
13. Reticuloendotheliosis	13. Bone marrow aspirations, 2; x-rays of bones.
14. Hodgkin's—giant follicular lymphoblastoma, etc.	14. Bone marrow studies, 2; chest x-rays, 6; lack of adenopathy.
15. Lupus erythematosus-periarteritis	15. Urinalyses, 32; complete blood counts, 23.
16. Infectious mononucleosis	16. Heterophil agglutination titres with sheep RBC, 4; blood smears, 12.

up to the present; the former is a relatively newly discovered fact in its relation to the entity of Q fever. Again, a parallel may be made to the history of infectious mononucleosis which only in recent years has become appreciated as a malady of long duration following the subsidence of acute manifestations. Certainly no specific claims of superiority for treatment can be made in this case for streptomycin, aureomycin, or chloramphenicol, since each appeared to be suppressive at least temporarily. It is highly probable that the results of therapy predicated more from the duration of treatment plus continually and increasingly effective auto-immunity than from any specific therapeutic agent utilized.

FOLLOW-UP NOTES

The patient was observed as an out-patient in December 1949, seven months after final discharge from the hospital. He stated that except for pains in the calves of the legs, and ease of fatigue, he had been well since leaving the hospital. The latest blood complement-fixation titre for Q fever (Jan. 18, 1950) was found to be positive in dilutions of 1:2,048 (four plus in final tube).

The patient was seen in July 1950, and stated that he felt well. He stated that his hearing was not as good as it had been before his illness (streptomycin?) and that he still tired easily and had aching in the calves of the legs.

SUMMARY

A case of chronic relapsing Q fever of approximately nine months' duration is reported in detail. Each clinical relapse was characterized by the signs, symptoms, and laboratory data commonly reported in cases of Q fever in humans; each relapse was clinically similar to the preceding phase. Therapy included the use of streptomycin, sulfonamides, aureomycin, and chloramphenicol. Pertinent findings which occurred during therapy are described and discussed especially with relation to prolonged duration of any antibiotic therapy which may have as a side-effect a tendency toward bacterial suppression in the gastrointestinal tract. Reference is made to the fact that the organisms of Q fever produce not only acute clinical entities but also are capable of persistent localization within the body in a manner reminiscent of malarial parasites, and that, in all probability, autoimmune mechanisms are of at least equal importance to antibiotic or other therapy in the eventual cure.

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Progressive Muscular Dystrophy Associated with Retinitis Pigmentosa

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PROGRESSIVE muscular dystrophy and retinitis pigmentosa have been separately found associated with disorders of the endocrine system. The precise relationship between progressive muscular dystrophy and endocrine disturbance is not known. Attention has been called[5] to the occasional association of myopathic dystrophies with various endocrinopathies such as gigantism, stunted growth, acromegaly and dystrophia adiposogenitalis. Thyroid disturbance,[1] parathyroid insufficiency,[9] changes in the pineal gland[11] and pluriglandular abnormalities[2] have also been noted, as have hypoglycemia and deficient glycogenesis.[5, 6] Ironside[5] stated that the inherited defect responsible for the development of muscular dystrophy may also be the cause of the endocrine disturbance of secondary and less important nature.

In a series of 36 cases of primary myopathy, Hurwitz[4] noted thyroid enlargement, a small sella turcica, undescended testes and adiposogenital dystrophy, but felt that the changes were too infrequent to assume an endocrine disturbance as the cause of muscular dystrophy. He showed, however, that altered carbohydrate metabolism occurs in the majority of patients with dystrophy. Similarly Wilson, [13] while noting the frequency of hypoglycemia and deficient glycogenesis, attributed the presence of endocrine disturbances to coincidence.

Several studies on retinitis pigmentosa suggest pituitary dysfunction may play an etiologic role.[6, 7, 10, 12] Moehlig and Pino[8] found high-arched palate in 100 per cent of 21 patients with retinitis pigmentosa, 14 per cent of whom were offspring of consanguinous parents. They related high arching of the hard palate to disturbances in its common embryologic development with the pituitary. They also pointed out the close embryologic and anatomical associations between the pituitary, hypothalamus and retina and felt that pituitary function is involved in retinitis pigmentosa.

In Givner's and Bruger's series[3] of 14 patients with retinitis pigmentosa, 11 had creatinuria (eight were males). There was a high incidence of nerve deafness and of high-arched palate. They reviewed the literature and concluded that the disease is hereditary and due to autonomic and endocrine dysfunction. Wortis and Shaskan[14] found consanguinity in 6 per cent and deafness in 44 per cent of 41 patients with retinitis pigmentosa. There were associated changes such as persistent amenorrhea, polydactylism, obesity and thyrotoxicosis. They felt that retinitis pigmentosa is only a sign of a more generalized disturbance.

Paget's disease, chronic occlusive arterial disease and various nervous and ocular disorders have been described in connection with pigmentary degeneration of the retina. A review of the literature has disclosed no case of progressive muscular dystrophy associated with retinitis pigmentosa. For this reason and because of the possible relation of each of the two disorders to endocrine disturbance, a description of a patient with both diseases was thought to be of interest.

CASE REPORT

A 68-year-old unmarried white male entered the Los Angeles County General Hospital on June 9, 1948. From very early childhood he had been unable to see at night except for distinguishing light from dark. Vision was apparently normal during the day. Sight progressively became poorer, terminating in blindness in 1940.

From the Los Angeles County General Hospital.

In early childhood, the patient had an "unusually erect back." As a boy his biceps were very small. The calves appeared and felt normally muscular. At about the age of 16, weakness of the arms and especially the legs became prominent and the legs gradually grew thin. At first he could not run. Later he stumbled when walking. He was able to stand on his toes but could not raise his legs or climb stairs. In order to rise, it was necessary to pull himself up with the aid of the hands and arms. He continued in his occupation as a "press feeder" until the age of 20, when weakness forced him to stop working. There was slow progression of muscular weakness until, at the age of 60, the patient became bedridden.

He had never noticed muscle twitching, numbness, tingling, or disturbances of speech or swallowing. His last measured height was 5 feet four inches.

Family History: The patient's parents were not consanguinous. Otherwise, there was no information about the father or the father's family. Little information regarding the mother was obtainable except that she had "very weak back muscles." She died at a second childbirth, the infant being stillborn. The mother had had five siblings, one of whom also had a "weak back." None had eye disease, goiter or known endocrine disturbance. The maternal grandmother died of old age and the maternal grandfather of diabetes mellitus.

Physical Examination: The patient was a poorly developed, poorly nourished, intelligent, alert, white male of 68 whose temperature was 98.6°F., pulse rate 80, respirations 18 and blood pressure 150 mm. of mercury systolic and 90 mm. diastolic.

The pupils were round and slightly irregular; the right measured 5 mm., the left 4 mm. Both reacted sluggishly to light directly and consensually. There was bilateral total blindness. The extraocular movements were normal. Retinal examination, as described by a member of the department of ophthalmology, revealed "optic discs pale and cups deep with secondary type of atrophy. Fundus vessels very attenuated, especially the arteries. Large amorphous accumulations and smaller bone-corpuscle-like accumulations of pigment seen scattered about the fundus. Much choroidal sclerosis; choroidal vessels very prominent. Impression: retinitis pigmentosa."

The palate was not high-arched. Hearing was unimpaired. The thyroid was not palpable. Lumbar lordosis and scoliosis were present. There was no pronounced hirsutism.

The sternocleidomastoid muscles were atrophic, with pronounced bilateral weakness. There was inability to raise the head but fairly good ability to push the head backward. The shoulders could not be raised. In the upper extremities there was moderate atrophy of all muscle groups, but especially the proximal ones. The grip was very weak bilaterally. There was ability to move the fingers and wrists, though not freely. By means of a rapid "crawling" of the fingers up the chest, the patient moved the forearms. He could not move the arms. Partial flexor contractures at the elbows and moderate ulnar deviation of the hands were present. There was moderate atrophy of the thigh and leg muscles, especially the former, with inability to move the lower extremities except the toes. Bilateral "clawfoot" contracture was present. No fasciculations were noted. Sensation was intact except for slight hyperesthesia of the feet and ankles. All deep and superficial reflexes were absent. There were no signs of pathological changes in the toes.

Laboratory Data: The content of blood iodine was normal (6.5 micrograms). An oral glucose tolerance test (Folin Wu method) showed a fasting blood sugar level of 68 mg. per 100 cc. with a maximum rise to 137 mg. per 100 cc. in one hour and a return to 100 mg. in four hours. The hemogram and concentration of serum proteins were normal. Reactions to tests of the blood and spinal fluid were negative for syphilis.

Creatine and creatinine content of the urine were 0.46 gm. and 0.06 gm., respectively, in a total 24-hour urine volume of 760 ml. The electroencephalogram was moderately abnormal throughout. The basic rhythm was 8 per second and the amplitude 40 to 60 mv. In addition, 6 to 7 cycle per second waves were recorded diffusely.

Roentgenological studies of the lungs showed no abnormality. Films of the feet and knees showed pronounced atrophy of disuse with contracture deformity of the feet, apparently secondary to a neurological lesion. The skull showed no evidence of bony or intracranial disease. Diffuse osteoarthritis with some scoliosis of the spine was present, with bridging between some of the vertebral bodies and a congenital defect in the lamina of the first sacral segment.

Electromyographic samplings showed no muscle action potentials recorded from the right biceps, normal motor units recorded from all areas of the right opponens pollicis, and no normal units recorded from the left quadriceps. No fibrillations or fasciculations were noted. The impression was quantitative reduction of motor units only. No evidence of neuronal disease was developed. The findings were compatible with primary muscular disorder.

*Muscle biopsies:** "Section of rectus muscle: areas of fatty infiltration separated small bundles of musculature. A few of the muscle fibers appeared smaller than normal and were apparently in a stage of atrophy, although the usual appearance of hypernucleosis was not seen. Around some of these atrophic fibers there were areas of fibrosis. Most of the muscle fibers were, however, normal in size and appearance. Cross striations were distinct and nuclear content was not increased. Section of left biceps muscle: it was extremely difficult to find any recognizable skeletal muscle. Instead, there were areas of fibrosis having an irregular pattern and containing linear to globoid masses of adipose tissue. An occasional strand of acidophilic stained tissue probably represented remnants of skeletal muscle. Here and there was noted a group of nuclei, apparently the remnants of sarcolemma.

"Histological diagnosis: Primary muscular dystrophy with extreme atrophy and fibrous replacement of muscle."

COMMENT

The coexistence of progressive muscular dystrophy and retinitis pigmentosa may be merely fortuitous. The fact that the two disorders have not been reported together previously suggests this possibility. Abnormal creatine and creatinine excretion in the urine, which was shown by this patient, is not specific for muscular dystrophy. There was neither a high-arched palate, nor deafness, nor a history of consanguinity. It is interesting, moreover, that in a patient with two diseases, each of which in certain instances has been associated with pituitary dysfunction, nothing more suggestive of endocrine disturbance than a low fasting blood sugar could be demonstrated.

SUMMARY

Literature was cited which suggests the relationship of progressive musclar dystrophy and of retinitis pigmentosa to pituitary disturbance.

A case in which both disorders were combined, but in which no clinical evidence of endocrinopathy was demonstrated, has been presented.

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EDITORIAL

War and Doctors

War in Korea has pointed up the need for additional fighting men and, with them, additional medical officers. Doctors are more in demand than are members of other professions and groups, and many of them are today asking when their turns may come and, if so, by what means will they be called.

In World War II the country was plunged into all-out war on December 7, 1941. In the present conflict the United States is acting as the standard-bearer for the United Nations, presumably the spearhead force for an international police contingent expected to encompass elements from the armed forces of a score of countries. In these circumstances there is bound to be a totally different philosophy abroad than in the late days of 1941 and the months immediately following.

Added to the philosophical consideration is the fact that today there are many more physicians serving in reserve status with the armed forces than there were prior to Pearl Harbor. Many more are subject to call and are considered as qualified veterans.

In the circumstances many doctors are today asking if there is not some equitable order of going, so that those who served their country in the last war and are just now regaining their professional and economic status after that sacrifice may not be immediately called upon for a further period of service. Is there not, they ask, some logical means of spreading the burden among all of us? This question has led to the formation of groups in some states to provide an orderly system of medical officer recruitment. It has brought forth an official declaration by the A.M.A. House of Delegates and similar declarations by medical groups in the states and counties. Most recently it has resulted in the introduction of H.R. 9311 in Congress (the author: Representative Saylor of Pennsylvania) to call for an order of priorities in the recruiting and assignment of medical officers for the three branches of the armed forces.

The consensus in all quarters seems to be completely in accord with the resolution adopted by the House of Delegates of the A.M.A., which provides essentially: The priority for recruiting medical officers shall call for (1) those recent graduates who received part or all of their medical education at federal expense and who have not completed their required tour of duty *and* those who furnished their own funds for their medical education but were deferred from active duty because of their student status; (2) other physicians who did not serve in World War II, and (3) those physicians who served the least in World War II.

These priorities, with conditions of age, infirmity or absolute irreplaceability considered, appear to be pretty generally accepted in medical circles throughout the country. The logic of this order of service seems to be irrefutable.

Factually, the armed forces are now aiming at a total force of about 2,000,000 men. Military tables of organization now call for 3.6 medical officers per 1,000 men, or a total of 7,200 physicians for this force. A recent call for the voluntary enrollment of 3,000 medical officers brought forth only 200 volunteers.

The medical profession was signally honored in World War II in being permitted more or less to write its own ticket. Through Procurement & Assignment Service it was allowed to divide up its own resources for the good of the nation, and it is pretty

generally conceded that it did a good job. Now, with another international situation already under way, the profession will certainly be given a heavy responsibility, whether or not it is granted authority similar to that given in the last conflict. The question of reestablishment of Procurement & Assignment Service has not yet been answered officially; to date we do not know if this or a similar self-governing authority is to be set up. We do know, however, that the Council on Emergency Medical Service of the A.M.A. has been working most harmoniously with federal officials for several years. We also know that the leaders of the armed forces are fully aware of the need of complete cooperation with medical organizations and have done their utmost to extend such cooperation.

The medical profession today has an obligation to meet—the absolute necessity of seeing that the country's armed forces are properly supplied with qualified medical officers. Government can use its powers to draft doctors; Congress can pass laws to make specially trained citizens, including physicians, subject to a call to military duty beyond that required of other citizens; the armed forces can invoke mandatory calls to duty for reserve officers who have already been called upon for service in the last war.

With all of these considerations in sight, the wise course would seem to be for the medical profession to solve this problem before governmental agencies have even slight warranty to step in with force. Organized medicine should start at once to influence its members in the Number One category to volunteer their services. If this category is exhausted and a need still remains, the second group should be called upon. Finally, the third group should be influenced to serve, if the need goes that deep. In any event, this is a job for medicine, not government, to do.

CORRECTION

In the editorial "The Hess Report and What It Means," which appeared in the August issue of CALIFORNIA MEDICINE, a typographic error occurred.

The first sentence in the ninth paragraph was printed: "Thereafter, the American Hospital Association in March 1950, in a distributed brochure, quoted resolutions defining that in its opinion radiologic, pathologic, anesthesiologic and psychiatric departments are component parts of the hospital organization and are included properly in a 'patient-day' of hospital care."

The word *psychiatric* should have been *physiatric.*

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California Medical Association

Revised Proposed Constitution Submitted by Reference Committee No. 3, April 30, 1950

Herewith is printed, for the first time in CALIFORNIA MEDICINE, *the proposed C.M.A. Constitution introduced in the 1950 House of Delegates by Reference Committee No. 3 of that body. A second printing, in accordance with existing constitutional provisions, will be made prior to the convening of the 1951 House of Delegates in regular session.*

Included in this document is an additional proposed section introduced by Reference Committee No. 3 as an addendum to its original introduction of the proposed Constitution.

Members of the Association, and especially members of the House of Delegates, are urged to give this proposed Constitution a thorough study. It contains various provisions which are different from existing constitutional provisions and which have been under discussion in the House of Delegates in the past.

CONSTITUTION

ARTICLE I.—NAME, PURPOSES AND ORGANIZATION

Section 1.—Name

The name of this organization is California Medical Association (hereinafter referred to as the Association).

Section 2.—Purposes

The purposes of this Association are to promote the science and art of medicine, the protection of public health, and the betterment of the medical profession; to promote similar interests of its component societies; and to unite with similar organizations in other states and territories of the United States to form the American Medical Association.

Section 3.—Organization

This Association has two divisions: One, the Association as an organization; and Two, the Scientific Assembly. The Association as an organization includes component societies and their active members, the House of Delegates, Council, Commissions and Standing Committees. The Scientific Assembly includes all members of the Association and the scientific sections.

Section 4.—Definition of Component Societies

Component societies include all county medical societies (which may cover one or more counties) heretofore or hereafter chartered by this Association.

Section 5.—Component Society Charters

Charters to component societies may be granted and revoked as hereinafter prescribed, subject to the limitation that only one charter may be outstanding at any one time in any county.

ARTICLE II.—MEMBERSHIP

Section 1.—Classes of Members

The members of this Association shall consist of Active, Associate, Honorary, Retired, Life and Affiliate members.

Section 2.—Membership Qualifications, Rights, Privileges, Duties and Method of Election

The qualifications, rights, privileges, duties, obligations and methods of election of the several classes of membership are as stated in the By-Laws.

ARTICLE III.—GOVERNMENT OF THE ASSOCIATION

Part A.—House of Delegates

Section 1.—Composition

The House of Delegates shall consist of:

(a) Delegates elected by the members of component societies;

(b) Officers of the Association as hereinafter provided;

(c) Ex officio, with the right to vote, the District Councilors, and

(d) Ex officio, without the right to vote, the Past Presidents.

Section 2.—Representation

As the By-Laws shall provide, each component society shall be entitled to proportionate representation in the House of Delegates but with a minimum of two delegates.

Section 3.—Alternates

Alternates shall be elected, as specified in the By-Laws, in the same manner as delegates are elected. One alternate shall be seated in place of each delegate absent or disqualified for failure to attend meetings or other cause.

Section 4.—Terms of Delegates and Alternates

Delegates and alternates shall serve for two or three years as each component society may determine. One-half or one-third, as the case may be, of the allowed number shall be elected each year.

Section 5.—Quorum

A majority of the authorized number of delegates shall constitute a quorum.

Section 6.—Functions of the House of Delegates

The House of Delegates shall be the legislative body of the Association and shall exercise such other functions as the By-Laws may prescribe.

Section 7.—Issuance and Revocation of Charters

(a) The House of Delegates shall issue charters to medical societies of a county or combination of counties deemed eligible and which have made proper application therefor.

(b) The House of Delegates may suspend or revoke any such charter, after due notice and proper hearing, for cause. "Cause" shall be considered to be any conduct or action, on the part of any component society, deemed in contravention of the Constitution and By-Laws of the Association or the American Medical Association or their "Principles of Medical Ethics." "Cause" shall further be deemed to be any conduct or action of a component society deemed inimical to the best interests of the Association.

(c) It may act on the withdrawal or secession of any component society from the Association and take such measures as are deemed advisable and proper for reinstatement of any component society which may have withdrawn or had its charter suspended or revoked.

(d) A two-thirds affirmative vote of the delegates present and voting shall be necessary for any action under the provisions of this section.

Section 8.—Sessions of the House of Delegates

In each year there shall be one or more sessions of the House of Delegates as fixed in the By-Laws. Special sessions may be called and held as provided in the By-Laws.

Part B.—Council

Section 9.—Composition

The Council shall consist of:

(a) Eleven District Councilors elected from the councilor districts specified in this Constitution; and

(b) Six Councilors-at-Large elected by the House of Delegates, and

(c) The President, President-Elect, and Speaker.

In addition, the Secretary-Treasurer and Editor, ex officio, but without the right to vote.

Section 10.—Councilor Districts

There are eleven districts as follows:

District Number One, comprising San Diego County.

District Number Two, comprising Imperial, Orange, Riverside, San Bernardino, Mono and Inyo counties.

District Number Three, comprising the County of Los Angeles.

District Number Four, comprising the County of Los Angeles.

District Number Five, comprising Ventura, Santa Barbara and San Luis Obispo counties.

District Number Six, comprising Kern, Kings, Tulare, Fresno, Madera, Merced, Mariposa, Stanislaus, San Joaquin, Calaveras and Tuolumne counties.

District Number Seven, comprising Monterey, San Benito, Santa Cruz, Santa Clara and San Mateo counties.

District Number Eight, comprising San Francisco County.

District Number Nine, comprising Alameda County and Contra Costa County.

District Number Ten, comprising Marin, Solano, Napa, Sonoma, Lake, Mendocino, Humboldt and Del Norte counties.

District Number Eleven, comprising Sacramento, Amador, Alpine, Eldorado, Placer, Nevada, Sierra, Yuba, Sutter, Yolo, Colusa, Glenn, Butte, Plumas, Tehama, Trinity, Shasta, Lassen, Modoc and Siskiyou counties.

Section 11.—Election of Councilors

(a) District Councilors shall be elected by vote of the delegates from each district in the manner and at the time specified in the by-laws; provided, however, that at the first meeting of the House of Delegates after a district councilor has been selected, his name shall be submitted to the House by the delegates from the district, and (1) if there is no challenge by any delegate then the speaker shall declare his election completed, and (2) if any delegate shall challenge the election on any ground, including fitness of the nominee of the district to serve as a district councilor, the questions presented by the challenge shall be submitted to a Qualifications Committee consisting of the President, President-Elect and one delegate, appointed by the speaker, from the councilor district involved. The Qualifications Committee shall consider all grounds upon which the nominee is challenged and report back to the House. If the committee reports in favor of confirming the nominee's election, the speaker shall declare him elected. If the committee reports against confirming the nominee's election, a three-fourths affirmative vote shall be necessary to sustain the report of the committee, in which event the nominee

shall be ineligible to serve as the district councilor and the delegates from the district shall immediately proceed to the selection of another nominee for the vacant office. If an adverse report of the Qualifications Committee is not sustained then the nominee shall be declared elected by the speaker.

(b) Councilors-at-Large shall be elected one by one from nominations made on the floor of the House of Delegates. Not more than two councilors-at-large shall be elected from any one councilor district.

Section 12.—Councilors: Terms of Office

Councilors shall serve for terms of three (3) years; one-third to be elected in each year.

Section 13.—Council: Powers and Duties

Subject to the provisions of this Constitution, and all resolutions and enactments of the House of Delegates, the Council shall be vested with full and complete power and authority to manage, control, use, invest, reinvest, lease, make contracts in respect of, and concerning, convey, give, grant, transfer or otherwise dispose of all property and assets of whatever kind or nature owned by the Association, and shall also be vested with full and complete power and authority to do and perform all acts and to transact all business for and on behalf of the Association and to manage and conduct all the work and activities of the Association in carrying out the purposes thereof. The Council shall have such additional duties, powers and functions as are prescribed in the By-Laws.

Section 14.—Election of Councilors on Adoption of this Constitution

Upon the adoption of this Constitution, the delegates from each of the eleven councilor districts shall proceed to elect district councilors as follows: At the annual meeting at which this Constitution is adopted the councilors of the First, Fourth, Seventh and Tenth districts shall be elected for terms of one year each; councilors of the Second, Fifth, Eighth and Eleventh districts shall be elected for terms of two years each; and councilors of the Third, Sixth and Ninth districts shall be elected for terms of three years each. Thereafter, as each term expires the delegates from each district shall elect a district councilor to serve for a term of three years.

Upon the adoption of this Constitution, the councilors-at-large holding office at the time of the adoption shall serve the remainder of their terms of office specified in the previous Constitution and as their terms expire successors shall be elected in the manner and for the terms provided in this Constitution.

Upon the adoption of this Constitution and the election of eleven district councilors the terms of office of the nine district councilors elected prior to the adoption of this Constitution will immediately cease and terminate.

ARTICLE IV.—FUNDS, PROPERTY, DUES, ASSESSMENTS AND EXPENDITURES

Section 1.—Annual Dues

At each regular session the House of Delegates shall, by a majority vote, fix the annual dues to be paid by members of the Association for the ensuing calendar year. Dues payable by active members shall be uniform and equal, except that the House of Delegates may reduce dues for certain groups (by general classification) as the By-Laws may expressly permit.

Dues payable by associate members shall be uniform and equal but may be set at not less than one half the regular dues for active members.

Section 2.—Military Service

During any period at which the United States is at war or requires services of doctors of medicine under an universal military training or draft program, annual dues may be reduced or waived by the House of Delegates with respect to those members serving in the Armed Forces of the United States during the whole or any part of any year.

Section 3.—Leaves of Absence

The Council, on recommendation of a component society, may grant leaves of absence to active members who are seriously ill and cannot practice or who leave practice temporarily for postgraduate study or other purposes acceptable to the component society and the Council and during such leave a uniform reduction of dues shall be established by the Council; provided no leave may exceed one year but shall be subject to renewal.

Section 4.—Special Assessments, etc.

Funds may also be raised by any of the following methods: (a) publications of the Association; (b) voluntary contributions; (c) bequests, legacies, devises, and gifts; (d) special assessments levied by the House of Delegates; and (e) in any other manner approved by the House of Delegates. In the event that the House of Delegates levies any special or other assessment than the annual assessment of dues, it may, in the resolution levying the assessment, fix and determine the time within which such assessment must be paid, the class or classes of members of the Association upon whom it is levied, and the penalty, if any, including forfeiture or suspension of membership in this Association or the component society, or both, to result from nonpayment thereof within the time prescribed.

Section 5.—Annual Budget and Expenditures

At each regular session of the House of Delegates, the Council shall submit to it an itemized budget stating the proposed expenditures of the Association for the ensuing year. The budget may be altered or revised by the House of Delegates, but must be adopted by the House before adjournment of the session. After its adoption, no expenditures in ex-

cess of the amount of the budget item covering the subject of such expenditures may be made in the year covered by the budget by the Association or any of its officers, agents or employees, unless the Council by a three-fourths vote of all voting members shall first approve such excess expenditure by resolution duly adopted. Recurring items in the budget (fixed expenditures covering more than one year) shall, when first adopted, be binding as to subsequent budgets to the extent of commitments or obligations entered into by the Association within authority granted by the House of Delegates or this Constitution or the By-Laws.

Section 6.—Benevolence Fund

At least $1.00 out of the annual dues paid by each active member of the Association shall be allocated to the Physicians' Benevolence Fund and shall only be used for the purposes as set forth in the By-Laws.

Section 7.—All Funds and Moneys to Be Paid to Secretary-Treasurer and Deposited With Depositary

All funds and moneys received for the Association by any officer or agent thereof shall be promptly paid to the Secretary-Treasurer and by him deposited with a depositary selected as such by the Council.

All depositaries selected by the Council shall be banks or trust companies duly licensed to transact business as such in the State of California.

Section 8.—Membership Interest in Association Property

No person other than an active member in good standing shall have any interest in the property of the Association and the interest of any active member therein shall cease when he ceases to be a member of the Association.

If any active member shall resign or otherwise cease to be an active member of the Association, all of his interest in and to all property of the Association shall cease and such cessation of membership shall operate as a release and assignment to the Association of all the right, title and interest of such member in and to all the property of the Association.

ARTICLE V.—REFERENDUM AND PETITION

Section 1.—Referendum and Petition

The right of referendum and petition shall be as set forth in the By-Laws.

ARTICLE VI.—OFFICERS

Section 1.—Officers

The officers of this Association shall be a President, a President-Elect, a Secretary-Treasurer, a Speaker of the House of Delegates, a Vice-Speaker of the House of Delegates and an Editor.

Section 2.—Powers and Duties of the President-Elect

The President-Elect shall act for the President in his absence or disability, and if the office of President becomes vacant the President-Elect shall then succeed to the Presidency to serve as President for such unexpired term and for the term of one year thereafter.

ARTICLE VII.—SCIENTIFIC ASSEMBLY

Section 1.—Objects

The Scientific Assembly of the California Medical Association is the convocation of its members for the presentation and discussion of subjects pertaining to the science and art of medicine.

Section 2.—Sections

The Scientific Assembly shall be divided into sections, each section representing that branch of medicine described in its title.

Section 3.—Creation of New Sections

New sections may be created or existing sections discontinued by the House of Delegates. The Scientific Assembly and its sections shall be conducted in accordance with the provisions of this Constitution and the By-Laws, and such other instructions by the House of Delegates or the Council as may not be in conflict therewith.

ARTICLE VIII.—MISCELLANEOUS

Section 1.—Incorporation

(a) To aid in carrying out the objects of the Association, the House of Delegates at any meeting of any regular or special session thereof may by a two-thirds vote of the members thereof present and acting, authorize, empower and direct the Council to cause the formation and organization of a non-profit corporation under the laws of the State of California, without capital stock, with such incorporators, name, purposes, objects, principal place of business, term, number of directors and directors to serve for the first year and until their successors are elected and have accepted office, and with such provisions regarding the voting power and property rights and interests of the members of the corporation and such further provisions in the Articles of Incorporation thereof, and with By-Laws and composed of such members representing this Association as the Council shall prescribe, fix and determine. The House of Delegates may at its option in connection with the granting and giving of such authority, power and direction to the Council, prescribe, fix and determine any or all of such matters pertaining to the said corporation, its Articles of Incorporation and any provision thereof, By-Laws and membership, and its action thereon shall bind the Council; and the House of Delegates at any meeting of any regular or special session thereof may by a two-thirds vote of the members thereof present and acting, authorize, empower and direct the Council to grant, assign, transfer, convey and deliver, or cause to be granted, assigned, transferred, conveyed and delivered to the said corporation upon the formation thereof without any consideration therefor, any property, real or personal, of the Association, which authorization, power and direction may be given prior or subsequent to the formation and organization of said corporation.

(b) To further aid in carrying out the objects of the Association, the House of Delegates at any meeting at any regular or special session thereof may, by a two-thirds vote of the membership thereof present and acting, authorize, empower and direct the Council to cause the formation and organization of one or more corporations under the laws of the State of California with such incorporators, name, purposes, county where the principal office for the transaction of business is to be located, first directors, the total number of shares, the aggregate par value, if any, of all shares, classes of shares, par value of any shares having par value, statement of the provisions, privileges and restrictions granted or imposed upon the respective classes of shares, or if the corporation be formed without capital stock the authorized number and qualifications of its voting and other rights of each class of members and the liability of each and all classes, to dues or assessments, and with such further provisions in the articles of incorporation thereof and with such by-laws as the Council shall prescribe, fix and determine; and the House of Delegates at any meeting of any regular or special session thereof may, by a vote of two-thirds of the members thereof present and acting, authorize, empower and direct the Council to grant, assign, transfer, convey or deliver or cause to be granted, assigned, transferred, conveyed or delivered to any of such corporations upon the formation thereof or to applicants for health and accident or other insurance in or from any of said corporations at or prior to the formation thereof without any consideration therefor, such funds and property, real or personal, of this Association as the House of Delegates shall from time to time authorize or ratify.

Section 2.—Seal

The Association shall have an Association seal consisting of a circle having on the circumference the words "California Medical Association, Eureka, 1856," with such further emblems, figures and words as the House of Delegates, on recommendation from the Council, shall prescribe.

The power to change the seal shall rest with the House of Delegates.

Section 3.—Amendments

Any member of the House of Delegates at any meeting of any session, other than a special session, thereof may present an amendment or amendments to any article or articles or any section or sections of any article or articles of this Constitution.

Such proposed amendment or amendments shall be in writing and shall be filed with the Secretary and shall thereafter be published at least twice in separate issues of the official journal of this Association prior to the next session of the House of Delegates.

At the said next session, other than a special session, of the House of Delegates, such proposed amendment or amendments shall be submitted to the House of Delegates, for consideration at any meeting of the House of Delegates during that session, and if two-thirds of the Delegates present and voting vote in favor thereof, the same shall be adopted.

Section 4.—Repeal of All Provisions of Existing Constitution

All articles and all sections and all parts of all articles of the existing Constitution are hereby repealed.

* * *

PROPOSED CONSTITUTIONAL AMENDMENTS

Printed herewith for the first time are two proposed amendments to the Constitution which was introduced in the 1950 House of Delegates. These amendments were offered separately from the proposed new Constitution introduced by Reference Committee No. 3. A second printing will be made in a subsequent issue of CALIFORNIA MEDICINE.

Resolved, That Section 4 of Article IV of the constitution of this association, is hereby amended to read as follows:

Section 4, Special assessments, etc.

Funds may be raised by any of the following methods: (a) publications of the association; (b) voluntary contributions, (c) bequests, legacies, devises and gifts, (d) special assessments levied by the house and (e) in any other manner approved by the house. In the event that the house levies any special assessment or other assessment than the annual dues, it may, in the resolution levying the assessment, fix and determine the time within which such assessment may be paid and the class or classes of members upon whom it is levied.

The penalty for failure to pay such assessment shall be levied by the local society.

* * *

Resolved, That Section 9, Part B of Article III of the revised constitution of this association be amended as follows:

"Section 9, Composition.

"The council shall consists of:

"(a) Sixteen district councilors elected from the councilor districts specified in this constitution; and

"(b) Four councilors-at-large elected by the house of delegates, and

"(c) The president, president-elect, and speaker.

"In addition, the secretary-treasurer and editor, ex officio, but without the right to vote."

And that Section 10, Part B of Article III be amended as follows:

"Section 10, Councilor districts.

"(a) The state shall be divided into sixteen councilor districts according to economic and geographic lines. This division is to be effected by the council.

"(b) The state shall be reapportioned at least every five years or oftener if needed by the council.

"(c) The geographical areas of each councilor district and the number of the district shall be as stated in these by-laws."

PROPOSED AMENDMENT TO EXISTING CONSTITUTION

Be It Resolved, That Article VII, Section 1, of the Constitution of the California Medical Association be amended to read as follows:

ARTICLE VII.—COUNCIL AND EXECUTIVE COMMITTEE

Section 1.—The Council

The Council shall consist of the Councilors and ex officio: The President, the President-Elect, and the Speaker of the House of Delegates, each with all the rights of a Councilor.

Subject to the provisions herein, the Secretary-Treasurer and the Editor shall also be ex officio members of the Council, but without the right to vote.

The nine district Councilors shall be elected as follows:

In the interim between the first and second meetings of the House of Delegates at any annual session, the delegates from each Councilor district for which a councilorship is about to become vacant shall meet and elect a Councilor from that district. In the event that a majority of the delegates from any district are unable to agree upon a Councilor, the House of Delegates at its second meeting, shall elect a Councilor from that district. Those councilorships-at-large which are assigned to specified counties by reason of the size of their membership shall in similar manner be elected by the delegates from such specified counties. All nominees for councilorships must be members in good standing.

Unassigned Councilors-at-Large shall be elected by the House of Delegates. Not more than two Councilors-at-Large shall be elected from any one Councilor district; provided, however, that when any one Councilor district shall consist of a component county society having 1,500 or more members, two of the Councilors-at-Large shall be elected from its membership.

Any chapters, sections or paragraphs of the Constitution or By-Laws which are in conflict with this amendment are hereby repealed.

Proposed C. M. A. By-Laws

The following proposed by-laws represent essentially a set of by-laws prepared for submittal to the 1950 House of Delegates in the event the proposed C.M.A. Constitution then before that body were adopted. Inasmuch as the proposed Constitution was not adopted at that time, the original of these By-Laws was not presented to the House of Delegates for official action.

It should be borne in mind that until and unless a new Constitution is adopted by the House of Delegates, new By-Laws in codified form are meaningless. With a new Constitution, if voted, a new set of By-Laws becomes essential. Reference Committee No. 3 considered the original draft of these By-Laws at the time of the 1950 Annual Session. The draft printed here contains several changes from the original form, inserted to make this document completely in key with the proposed Constitution which is now lying on the table of the House of Delegates and which is printed above.

The interim session of the House of Delegates, scheduled for December 2-3, 1950, in Sacramento, will not be in a position to vote on these proposed By-Laws. However, the interim session, acting as a committee of the whole, may discuss this document as a preparatory measure before the 1951 Annual Session, at which time the proposed Constitution will be voted upon.

BY-LAWS

CHAPTER I.—COMPONENT SOCIETIES

Section 1.—Component Society Charters

The charter of each component society shall provide that all the provisions of the Constitution and By-Laws of this Association in force at the time of the issuance of such charter, together with all amendments to either thereof thereafter adopted, in so far as the same are applicable, shall be an integral part of the constitution and by-laws of the component society to which the charter is issued and that the terms and provisions thereof shall control and govern such component society, the officers and members thereof, and that the constitution and by-laws of the component society shall not be amended in any way to conflict or be inconsistent with the Constitution and By-Laws of this Association. Each charter shall be signed by the President and the Secretary-Treasurer of this Association.

Section 2.—Revocation of Component Society Charters

The charter of a component society may be suspended or revoked on any of the grounds specified in the Constitution only in accordance with the following procedure:

(a) *Complaint.* A written complaint, stating the grounds for action, shall be filed with the Secretary-Treasurer by the Chairman of the Council pursuant to resolution adopted by the Council by the affirmative vote of two-thirds of the members thereof.

(b) *Notice.* The Secretary-Treasurer of the Association shall, within thirty days of its receipt by him, send by registered mail to the secretary of the component society concerned, a true copy of such complaint.

(c) *Hearing.* Hearing on such complaint shall be held by the House of Delegates at a meeting of its first session occurring not sooner than three nor more than ten months after the date of its presentation to the Secretary-Treasurer of the Association.

(d) *Decision.* Suspension or revocation of the charter of a component society shall require a two-thirds affirmative vote of the members of the House of Delegates; provided, however, that the delegates of the component society concerned shall not vote, and their number shall not be counted in determining the necessary two-thirds majority.

Section 3.—Component Society Sections

(a) *Geographical or Specialty Sections.* A component society may authorize the formation and existence of branch geographical or specialty sections for scientific investigation and work only, and the members of such geographical sections or specialty sections must be members of such component society.

(b) *Members in Sections to Be Members of Respective Component Societies.* No geographical or specialty section shall be permitted to have any classes of members which classes in whole or in part include non-members of the component society of which any such geographical or specialty section is a branch or subdivision; provided that nothing in this section shall be construed as limiting the guest privileges of such non-members at meetings of such section.

CHAPTER II.—MEMBERSHIP

Section 1.—What Constitutes Membership

The name of a doctor of medicine on the official roster of this Association, after it has been properly reported by the secretary of his component society, and after the dues or other assessments due this Association shall have been paid by the component society for each such member according to the class of membership held by each component society member, shall be prima facie evidence of membership.

Section 2.—Component Society Rosters of Members; Reports

(a) *Roster.* The secretary of each component society shall keep a roster of its members, on which shall be shown the full name, address, school and date of graduation, date of license to practice in this state, class of membership, and such other information as the Secretary-Treasurer of the Association shall prescribe.

(b) *Reports.* The secretary of each component society shall furnish the Secretary-Treasurer of the Association before the first day of March of each year a list of names and addresses of all members in good standing on the first day of January of each year, shall notify in writing the Secretary-Treasurer monthly of all changes in membership of the component society, and shall submit to the Secretary-Treasurer on forms which the Association shall provide, notice of each application for membership in such component county society with the name, address and all other particulars regarding the applicant known to the secretary.

Section 3.—Qualifications of Active, Associate and Affiliate Members

(a) *Component Societies Sole Judges.* Each component society shall, subject to the minimum requirements for eligibility as hereinbelow provided, determine the qualifications for membership for Active, Associate or Affiliate membership therein, and shall be the sole judge of the qualifications of applicants for such membership.

(b) *Qualifications for Active Members.* To be eligible for election to Active membership in a component society, an applicant must hold the degree of Doctor of Medicine issued to him by an institution of learning accredited at the time of the issuance of such degree by the Board of Medical Examiners of the State of California. He must hold an unrevoked license to practice medicine and surgery issued to him by the Board of Medical Examiners of the State of California, which certificate must have been recorded in the office of the County Clerk in the county in which he practices. He must be of good moral and professional character and must not support, nor practice, nor claim to practice, any exclusive or sectarian system of medicine. He must subscribe to the Principles of Medical Ethics of the American Medical Association and to such as may from time to time be adopted by the California Medical Association, and shall recognize the authorized officers of his component society and of this Association as the proper authority to interpret any doubtful points of ethics.

(c) *Qualifications for Associate Members.* To be eligible for election to Associate membership in a component society, an applicant must possess all the qualifications necessary for active membership except that he shall not be engaged in the private practice of medicine and need not hold a license to practice medicine or surgery granted by the Board of Medical Examiners. For the purposes of this section, a Doctor of Medicine engaged in the private practice of medicine is any physician who receives his principal compensation for professional services on a fee basis.

(d) *Qualifications for Affiliate Members.* To be eligible for election to affiliate membership in a component society, an applicant must be, and must continue to be throughout the term of his membership, an intern, resident or house officer in an approved hospital within the county of the component society concerned.

Section 4.—Qualifications and Election of Other Classes of Membership

(a) *Retired Members.* The Council, on recommendation of any component society, may grant retired membership to those active members who have ceased the practice of medicine to the extent and for reasons satisfactory to such component society and the Council, and who shall have been active members of the Association for a total of ten years prior thereto. Retired membership shall endure as long as the retired member does not engage in full time practice of medicine; but in the event that a member classified as retired resumes active, full time practice of medicine such resumption shall automatically terminate retired membership and reestablish active membership. Upon resumption of full time practice by any retired member, the secretary of his component society shall transfer such member from the retired classification to the active classification, and notify the Secretary of this Association, who shall do likewise with respect to the membership rolls of this Association.

(b) *Honorary Members.* The House of Delegates on recommendation by the Council may elect as honorary members any persons distinguished for their services or attainments as doctors of medicine or in the field of public health, or for research or other scientific work contributing to medicine.

(c) *Life Members.* Those life members elected prior to the adoption of these By-Laws shall remain as such with all of the rights and privileges pertaining to such membership contained in the prior By-Laws, but no new life members shall be elected after the date of the annual session of the House of Delegates at which this section is adopted.

(d) *Special Memberships.* The House of Delegates may, from time to time, establish special and limited classes of membership in this Association for undergraduate medical students, or for interns, house officers, or residents wherever a component society makes no provision for this class of membership. The House of Delegates may also, from time to time, establish other special and limited classes of membership and fix the dues, qualifications, duration and privileges of such membership.

Section 5.—Rights and Privileges of Membership

(a) *Active Members.* Subject to the provisions of the Constitution and these By-Laws, all active members shall be equally privileged to vote, to hold office and to enjoy all other rights and privileges of the Association.

(b) *Associate Members.* Subject to the provisions of the Constitution and these By-Laws, associate members shall have all the rights and privileges of Active Members except the right to vote or to hold office.

(c) *Affiliate, Honorary and Retired Members.* Members in these classes shall be privileged to receive publications of the Association at such rates as the Council may from time to time determine; they shall not have the right to vote nor to hold office.

Section 6.—Membership Where No Component Society Exists

Any Doctor of Medicine residing in an area in which there is no component society may apply for membership in the component society most convenient to the area in which he practices medicine, and if otherwise qualified he may be elected to membership therein.

Section 7.—Membership Where Major Office and Residence Are In Different Component Society Areas

A Doctor of Medicine may apply for membership only to that component society whose charter covers the area in which his major office for professional practice is located; provided that a Doctor of Medicine who resides in one county and practices in another may apply for membership to the component society whose charter covers the area in which his residence is located, if both such component society and the component society of the area in which his major office is located approve.

Section 8.—Membership as Affected by Transfer of Location of Office

A member who changes his office from the county through whose component county society he holds membership in this Association, to another county in which there is a component society, is eligible to membership in the component society of his new location on the presentation of a transfer card, and satisfactory evidence that his dues have been paid in full in the component society in which he holds membership; provided, however, that no evidence which would disqualify him for membership exists.

He shall forfeit his membership in this Association one year after such change of location of practice unless after proper application he is elected to membership in the society of the county to which he has moved.

Section 9.—Transfer Cards

When a member in good standing in a component society moves to another county or other jurisdiction in this state he shall, on request, be given a transfer card, without cost. He must assume such financial obligations as shall be deemed proper by the component society to which he is transferred, and to which he makes application for membership by transfer.

Section 10.—Termination of Membership

(a) *By Expulsion from Component Societies.* Expulsion from any component society, after due proceedings in accordance with these By-Laws, upon becoming final terminates all the rights and privileges in this Association of the member so expelled.

(b) *By Failure to Pay Dues.* If the annual assessments of dues, payable to this Association or to the American Medical Association by any member of this Association, are not paid in full on or before April 1 of any year, such member shall automatically lose his membership in this Association as of April 1 of such year. The Council of this Association, in its discretion, upon payment of such unpaid dues, and any other assessments or dues accruing thereafter, may at any time reinstate such member.

(c) *By Revocation of Physician and Surgeon's Certificate.* Any member whose license to practice medicine and surgery in the State of California is revoked shall, upon receipt of written evidence of such revocation by the Secretary of this Association, thereupon cease to be a member of this Association.

(d) *Acts and Conduct Subjecting Member to Censure, Suspension or Expulsion by Component Society.* Any member of a component society who has been adjudged guilty of a criminal offense involving moral turpitude, or who has been duly adjudged guilty by his component society, in accordance with the procedural requirements of these By-Laws, of gross misconduct as a physician or a surgeon or of a violation of any of the provisions of the constitution or by-laws or principles of professional conduct of his society or of the Principles of Medical Ethics promulgated from time to time by this Association or by the American Medical Asso-

ciation, shall be subject to censure, suspension or expulsion from his society by such component society.

CHAPTER III.—DISCIPLINARY PROCEDURE

Section 1.—Disciplinary Procedure for Component Societies

The procedure to be followed by each component society with respect to the censure, suspension or expulsion of a member shall be:

(1) *Charges; Formal Requirements; a Formal Charge Must First Be Made.* Such charge must be in writing, signed by the accuser, and if made by a person other than a member of the society must be sworn to before an officer of the State of California authorized to administer oaths. Charges must state the acts or conduct complained of with reasonable particularity.

(2) *Charges; Filing; Secretary's Duties; Presentation to Board of Directors (or Grievance Committee).* Charges must be filed with the secretary of the accused member's component society. At the first regular or special meeting of the Board of Directors (or other governing body, whether called Council, Board of Trustees, Executive Committee, or any other name, all of which are herein included in the term "Board of Directors") of such component society held after charges are filed, the secretary must present said charges to the Board. The Board of Directors shall then or at any adjournment of said meeting, but not more than thirty days after the date of such regular or special meeting, consider the charges, and in its discretion determine whether or not further proceedings shall be conducted. If the Board determines that no further action shall be taken, the charges shall be dismissed.

If a component society has no board of directors and more than ten members, its members must, at a regular meeting of the society, elect a grievance committee of not less than five (5) active members in good standing; two members shall be designated by the society to serve for a period of one year, two members shall be designated to serve for a period of two years, and one member shall be designated to serve for a period of three years. At the expiration of the terms of office of the respective members of such committee, successors shall be elected in like manner to serve for a period of three years each. Such grievance committee shall exercise all the power and perform all the duties herein conferred upon boards of directors in the manner and within the times herein provided. If a society has less than eleven members, the entire society, exclusive of the accuser and accused, shall constitute the grievance committee. All references herein to board of directors shall be deemed to include such grievance committees, and component societies of ten members or less.

(3) *Service of Charge Upon Accused.* If the Board of Directors determines that further action, with respect to said charges, shall be taken, the Board must, within fifteen (15) days after such decision, cause a copy of the charges to be served upon the accused by personally delivering a copy thereof to him, or by depositing a copy thereof in the United States mail, registered and addressed to the accused either at his last known office or at his last known residence.

(4) *Time and Place for Hearing; Service of Notice Thereof.* The Board of Directors shall, at said meeting at which its decision to proceed is made, fix a time and place for a hearing of said charges. Written notice of the time and place set for the hearing shall be served upon the accused within fifteen (15) days by personal delivery or registered mail as aforesaid.

The time so set for a hearing shall be not less than fifteen (15) days after the accused has been served as aforesaid, with a copy of the charges and with the notice of the time and place set for the hearing; said hearing must be held within the county in which the accused holds his county society membership. The hearing before the Board of Directors must actually commence within six months from the date of the filing of written charges. Failure to comply with this requirement shall constitute an automatic dismissal of the charges.

(5) *Right of Accused to Answer; Time to Answer; Formal Requirements.* The accused may, not less than five (5) days before the time set for a hearing, answer said charges. The answer shall be in writing and the original and three copies shall be filed with the secretary of the society; provided, however, that the failure of the accused to answer shall not be deemed to be an admission of the truth of the charges or a waiver of the accused's right to a hearing with respect to said charges.

(6) *Rules Governing Hearing; Duties of Referee of Society; Advice as to Procedure Only.* The Board of Directors shall give ample opportunity both to the accuser and the accused to be heard in person, and to present all testimony, evidence, or proofs which the accuser or the accused may deem necessary, provided that the Board may reject all testimony, evidence, or proofs, which in the judgment of the Board are immaterial, irrelevant or unnecessarily repetitious.

Either the Council or the Executive Committee of the California Medical Association, whenever it shall come to the attention of either thereof that a disciplinary proceeding is pending before any component society, may of its own motion, and shall, upon the request of such component society or of the member or members thereof the subject of any such disciplinary proceeding, appoint a referee who may, but need not be, a member of the California Medical Association, and shall cause the Secretary of the California Medical Association to notify the secretary of such component society of such appointment. The referee so appointed shall preside at the hearing of said charges and shall make all decisions concerning the admission or rejection of testimony or other evidence and procedure. The referee shall not, however, have any voice nor participate in any manner in the determination by the Board of Directors of the disposition of the charges. During the hearing the referee shall perform all duties normally per-

formed by the presiding officer of the Board of Directors.

(7) *Record of Proceedings; Shorthand Reporter; Duty of Secretary to Preserve Board Records; Right of Accused to Copy.* The secretary shall preserve the original of said charges with a certificate of personal delivery or of mailing of a copy or copies thereof, as the case may be, the original notice of the time and place set for the hearing with a certificate of personal delivery or of mailing of a copy or copies thereof, as the case may be, and the original of the answer filed by any member accused if an answer be filed. At the hearing, the Board of Directors shall, at the expense of the society, employ a competent shorthand reporter to record and transcribe into typewriting testimony adduced on behalf of the accuser and the accused and all rulings made. The original charges with certificate of service thereof, the original notice of time and place for hearing with certificate of service thereof, the answer or answers, if any be filed, all documentary evidence introduced at the hearing, the typewritten transcript of the testimony and the written decision of the Board of Directors shall constitute the record of the entire proceedings. The Secretary shall, upon receipt from accused of a sum sufficient to defray the cost thereof, cause a copy or copies of such record to be transcribed, certified and furnished to the accused.

(8) *Decision of Board; When Must Be Written; Rules Governing Vote of Board.* The Board of Directors, after having given the accuser and the accused member full opportunity to be heard, shall conclude the hearing and shall render its decision in writing not more than thirty (30) days thereafter. Hearing shall include any oral arguments and the filing and consideration of any written briefs. The Board of Directors by a two-thirds affirmative vote of all the eligible members of the Board present and voting may exonerate or may censure, suspend or expel the accused member as the facts in its opinion may justify.

The decision of the Board of Directors may be expressed in resolution adopted by said vote. The decision may, but need not, contain an opinion and need only be signed by the secretary or the acting secretary of the component society.

The failure of at least two-thirds of all the members of the Board of Directors present and voting to agree upon the disposition of the charges shall act automatically as a dismissal of the same. No member of the Board of Directors not present at the said hearings for the entire time thereof shall be entitled to vote with respect to the disposition of the charges.

(9) *Suspension; Maximum Period; Status of Suspended Member.* If the Board of Directors shall determine to suspend an accused member, the term of such suspension shall be within the discretion of the Board, provided that in no case shall a member be suspended for a period greater than one year. A suspended member shall have no rights or privileges in the society, provided that at the expiration of the period of suspension such suspended member shall not be reinstated to membership in good standing until he applies for reinstatement and pays all dues accrued during said period of suspension.

(10) *(a) Board's Decision; Secretary to Send Copies.* Within ten (10) days after the decision of the Board of Directors, the secretary of the society shall transmit a copy of the decision to the Board, to the accused member or members and to the Secretary of this Association.

(b) Board's Decision Final; Subject to Appeal. The action of the Board of Directors of a component society shall be final, subject only to appeal to the Council of the California Medical Association in such cases as are provided in these By-Laws.

The decision of the Board of Directors shall not become effective until the expiration of ten days after time during which an appeal may be taken to the Council of this Association. Filing an appeal with the Secretary of this Association shall automatically stay the execution of the decision of the Board of Directors of the component society until written notice of the action of the Council of this Association with respect to appeal has been received by the secretary of the component society from which the appeal was taken.

(c) Technical Rules of Evidence Not to Govern Disciplinary Hearings. All hearings with respect to the disposition of charges against a member of a component society shall be held and conducted in such manner as to ascertain all the facts fairly to the accuser and accused, eliminating all formal or technical rules and requirements which ordinarily pertain to judicial proceedings.

(d) Members Agree That No Cause of Action Shall Accrue. Any person so charged, censured, suspended, or expelled shall have no claim or cause of action against this Association, a component society or any member, director, councilor or officer, thereof by reason of such charges, or the hearing or the consideration thereof or censure, suspension or expulsion therefor.

(e) Expelled Members; Right to Apply for Membership; When Accrues. Any person whose membership has been involuntarily terminated in a component society by reason of violation of these By-Laws may apply for membership after the expiration of one year from the date said membership was terminated, and such application shall be considered in the same manner as a new application for membership.

Section 2.—Procedure for Appeal to Council

A member of a component society censured, suspended or expelled by his county society may appeal from the action of such component society to the Council of this Association within the period of two months succeeding the date of such censure, suspension, or expulsion. Appeals shall be in writing and be filed within the said period of two months in the office of the Secretary of this Association. Said appeal shall be accompanied by a copy of the record of the entire proceedings before the component society duly certified by its secretary, provided the Chairman

of the Council may, in his discretion, extend the time of the appellant to file said record. Upon the filing of an appeal the secretary shall present it to the first subsequent meeting of the Executive Committee or the Council. Appeals shall be heard by the Council only after reasonable notice of not less than ten (10) days in writing of the time and place of the hearing of the appeal has been given to the appellant member and the president and secretary of the component society as provided in Section 4 hereof.

Section 3.—Rules Governing Appeals

In hearing appeals, the Council shall review all questions of procedure, and may, in its discretion, review the evidence contained in the record of the original proceedings held before the Board of Directors of the component society. The Council may make findings of fact contrary to, or in addition to, those made by said Board of Directors. Such findings may be based on the evidence adduced before said Board of Directors, either with or without the taking of evidence by the Council. The Council shall use any lawful means which in its judgment will best and most fairly present all the facts involved. The Council may, for the purpose of making such findings or for other purpose in the interest of justice, take additional evidence of or concerning facts material to the questions involved, or may, for such purpose, appoint a committee of its members or any notary public to act as referees or referee for the taking of such additional evidence.

Such referee or referees shall render a report in writing to the Council, which report shall contain a clear statement of the facts found by the referee or referees from the testimony or evidence adduced.

The Council may affirm, reverse or modify the decision of the Board of Directors or make such other disposition of the proceedings as it may deem proper.

In every case of an appeal the individual councilors and the Council, through a committee thereof, prior to any hearing being held upon the appeal, shall exert all proper efforts at conciliation and compromise.

This Association may be represented by its attorney to advise the Council upon procedural questions only.

The decision of the Council shall be final and bind the appellant member and the component society.

CHAPTER IV.—SESSIONS AND MEETINGS; SCIENTIFIC SECTIONS

Section 1.—Division of Scientific Work

(a) *Scientific Sections.* The scientific work of the Association shall be divided into fifteen scientific sections, as follows: General Medicine; General Surgery; Pediatrics; Eye, Ear, Nose and Throat; Urology; Anesthesiology; Obstetrics and Gynecology; Radiology; Industrial Medicine and Surgery; Pathology and Bacteriology; Dermatology and Syphilology; Neuropsychiatry; General Practice; Public Health; and Allergy.

(b) *Rules of Procedure of Scientific Sections.* Each scientific section shall adopt rules of procedure for its own better government and work. Its officers shall be responsible for the proper keeping of records of scientific and business meetings.

(c) *Officers of Sections.* The members of each section shall at the regular annual session of the Association elect a chairman and a secretary to serve for the term of one year.

(d) *Program.* Each of the sections shall present a scientific program at the annual session of the Association, and its officers shall be responsible for the proper preparation of the same, and for the proper cooperation with other scientific sections during the annual meeting.

Section 2.—Registration at Annual Sessions Necessary for Participation Therein

Each member in attendance at any session shall register, after his right to membership has been verified by reference to the records of this Association. No member shall take part in any of the proceedings of any session until he has complied with the provisions of this section of the By-Laws.

Section 3.—Addresses and Papers at Annual Session

(a) The program at Annual Sessions shall be divided between general meetings and section meetings as the Council shall deem appropriate.

(b) At the General Meetings shall be delivered the annual address of the President and, with the sanction of the Council, such other addresses and reports as may be deemed desirable.

(c) Excepting the President's address and such other addresses and reports as the Council may determine, no address or paper shall occupy more than twenty minutes in delivery.

(d) No member, except by unanimous consent, shall speak more than once in the discussion of any paper nor longer than five minutes at any one time. This subsection of the By-Laws shall be printed on all programs of general and section meetings.

Section 4.—Scientific Papers Property of Association

All papers read before this Association shall be its property.

Each paper, when it has been read, shall be deposited with the secretary of the section, by him to be promptly turned over to the Secretary of the Association.

Section 5.—Scientific Papers Not to Be Published Elsewhere

Authors of papers read before this Association shall not cause them to be published elsewhere except with the consent of the Committee on Publications.

Section 6.—Committee on Arrangements for Annual Session

(a) *Appointment and Duties.* The Chairman of the Council, subject to the approval of the Council, shall, at least six months before each annual session,

appoint a Committee on Arrangements for the sessions of the ensuing year, one member thereof being designated as the general chairman. This committee shall consist of five members.

The Secretary-Treasurer of the Association shall be ex officio a member of this committee.

This committee shall have charge of all local arrangements not otherwise provided for.

The terms of office of members of this committee shall expire when the succeeding committee on arrangements is appointed.

As the local Committee on Arrangements this committee shall provide suitable meeting places and shall have general charge of all local arrangements. The committee shall have power to appoint local advisory members and subcommittees to aid in its work.

(b) *Commercial Exhibits.* The Council shall decide what portion of the income from commercial exhibits or other convention services shall go to the local Committee on Arrangements. The location and rules for the commercial exhibits and other accessory annual session activities shall be subject to the approval of the Council.

(c) *Local Convention Expenses.* The Council shall decide what portion of the local expenses shall be borne by the Association.

(d) *Report on Committee on Arrangements.* The Committee on Arrangements shall make and file with the Secretary-Treasurer of the Association an itemized, detailed report of all its receipts and disbursements, and shall remit any moneys due the Association remaining in its possession, to the Secretary-Treasurer.

Section 7.—All Meetings of Same Session Shall Be in Same Locality

The general meetings of the Association, the meetings of the House of Delegates, and the meetings of the Scientific Assembly and its sections at any session shall be held in the State of California at the same locality and in buildings as convenient of access, one to the other, as may be possible.

CHAPTER V.—HOUSE OF DELEGATES

Section 1.—Secretaries of Component Societies To Furnish Lists of Delegates and Alternates: Election and Lists

Each component society shall elect a delegate and one alternate for such delegate in an aggregate number of delegates and alternates equal to the total number of delegates and alternates to which the component society is entitled. At least sixty days prior to the next scheduled session, the secretary of each component society shall forward to the Secretary-Treasurer of the Association, on forms provided by the Association, the names and addresses of each delegate and his alternate elected by such component society, and shall certify thereon the dates of election and expiration of terms of service of each delegate and his alternate.

Failure to conform to this provision shall constitute grounds for disqualification of the delegation in default for the scheduled session, at the discretion of the House of Delegates.

Section 2.—Representation

Commencing with the 1952 regular session of the House of Delegates, each component society shall be entitled to two delegates with one additional delegate for each one hundred active members, or fraction thereof, over and above its first one hundred active members, as of the first day of the preceding November.

Section 3.—Limitations on Seating of Delegates

Only duly elected delegates or their elected alternates may be seated at any session of the House of Delegates unless the Secretary of the Association has been given due notice of substitution at least fifteen (15) days in advance of the session.

Section 4.—Disqualification of Delegates or Alternates for Absence From a Session

Any delegate absent without good cause from two or more consecutive meetings of the House of Delegates, and who has failed to give fifteen days' notice to the Secretary of the Association of his inability to be present, shall thereupon be disqualified as a delegate and, in addition, ineligible for reelection as a delegate or alternate for three years immediately succeeding the expiration of his term; except that the Committee on Credentials may excuse absence on presentation of good cause therefor.

Section 5.—Notification of Delegates

The secretary of each component society promptly shall notify in writing each delegate and alternate immediately after his election to such office, and shall expressly direct each delegate's and alternate's attention to the provisions of Section 4 above.

Section 6.—Qualifications of Delegates and Alternates

At least three (3) years' active membership in good standing in the component society immediately preceding election shall be required for election as delegate or alternate.

Section 7.—Sessions and Meetings

(a) In each year there shall be two regular sessions of the House of Delegates; the time and place of such sessions to be determined by the Council as far as possible in advance and notice thereof published in the Journal of the Association. One of these sessions shall be held in the first six months of each calendar year and is designated the Annual Session; the other shall be held in the last six months of each calendar year and is designated the Interim Session.

(b) In addition to regular sessions, special meetings of the House of Delegates may be called at any regular or special meeting of the Council, by a two-thirds vote of all the members of the Council, or by written call stating the object of the meeting, filed with the Secretary in the office of the Association and signed by one-half or more of the members of the House of Delegates. Upon the filing of such call

with the Secretary, the Council shall within thirty (30) days thereafter fix the time and place for the holding of such special meeting and cause written notice thereof stating the object of the meeting to be sent by United States mail, postage fully prepaid, to each member of the House of Delegates, addressed to him at his office or place of residence, as shown by the records of the Secretary's office, at least fifteen (15) days prior to the date of the meeting.

(c) Resolutions and other new business may be introduced at either regular session, but shall not be acted upon until the next regular session; provided, however, that any resolution designated as an emergency measure may be acted upon at the session in which it is introduced, but shall require a two-thirds affirmative vote for adoption.

Section 8.—House of Delegates Committees

Prior to or at the commencement of each annual session the Speaker of the House shall appoint from the members thereof the following committees:

1. A Committee on Credentials,
2. A Reference Committee on Finance, to review the reports of the Secretary-Treasurer and Executive Secretary and to study and make recommendations to the House of Delegates on the budget submitted by the Council and the amount of dues for the ensuing year.
3. A Reference Committee on the reports of Officers, Council, Standing and Special Committees, and
4. Two or more Reference Committees on resolutions, amendments to the Constitution and By-Laws, and new and miscellaneous business (the Speaker may allocate amongst these committees all business properly referable to them).

Section 9.—Membership of Credentials and Reference Committee

Each of the aforesaid committees shall consist of three members, the chairman of each to be designated by the Speaker.

The Speaker, the House concurring, shall refer said reports, resolutions, and business to the respective Reference Committees, but may allocate among them any of said reports, resolutions or portions thereof, and other business, to avoid duplication and to expedite the business of the House of Delegates.

Each Reference Committee shall prepare a written report dealing with and making recommendations on all matters submitted to it. In those instances in which resolutions or other matters remain before a Reference Committee between meetings of the House of Delegates, copies of such resolutions or other matters and the recommendations of the committee thereon shall be mailed or delivered by the Secretary to each elected delegate and alternate at least thirty days (or if less than thirty days intervenes between meetings, as early as possible) prior to the meeting of the House of Delegates at which such resolutions or other matters and recommendations concerning them are to be considered. The report of each committee may be acted upon as a whole or section by section, as the House may determine.

Section 10.—Duties of Credentials Committee

The Secretary of the Association shall supply the Committee on Credentials with the necessary information concerning the membership of the House of Delegates.

The Secretary shall give this committee a list of component societies, showing the total membership as of November 1 of the preceding year. This committee shall ask each delegate and alternate to present his written credentials, but shall accept the official written list submitted by the secretary of any component society; provided that such written list be sent to the Secretary of the Association at least fifteen days before the beginning of the annual session.

The Committee shall make a written report to the House of Delegates of the delegates and alternates entitled to membership therein.

Section 11.—Special Committees of House of Delegates

The Speaker, the House of Delegates concurring, shall have the right to appoint special committees of the House for special work. All committees of the House of Delegates shall present their reports to the House of Delegates in writing.

CHAPTER VI.—COUNCIL

Section 1.—Council: Organization

At the first meeting of the Council held after the adjournment of the last meeting of the House of Delegates at the annual session of the Association, the Council shall organize by the election of one of the Councilors as Chairman of the Council, who shall serve as such up to the first Council meeting held after the adjournment of the last meeting of the House of Delegates of the next succeeding annual session of the Association; and a Vice-Chairman who shall hold office for the same term, and who, in the absence of the Chairman, shall perform the duties of the Chairman. The Secretary-Treasurer of the Association shall serve as the Secretary of the Council.

Section 2.—Registry

The Secretary-Treasurer, in writing, shall request each Councilor to register his address where he desires all notices to be sent to him by mail or telegram.

Section 3.—Order of Business

At meetings of the Council, business shall be transacted as the Council may determine from time to time by resolution.

The Council shall provide and fix the order of business of the House of Delegates at each session, provided that the House of Delegates may change the order of business by a majority vote.

Section 4.—Executive Committee of Council

The Executive Committee shall consist of the President, President-Elect, Chairman of the Council,

Chairman of the Auditing Committee, and one other member of the Council (elected by the Council at its organization meeting each year). The Secretary-Treasurer and Editor shall be members ex officio, but without the right to vote. The organization, duties and powers of the Executive Committee shall be as provided in the By-Laws.

Section 5.—Auditing Committee of Council

The Chairman of the Council, subject to its approval, shall appoint an auditing committee of three members, designating one of the members as its chairman.

The Auditing Committee shall inspect all bills and claims against the Association, and no bill or claim shall be paid except upon voucher or draft having the approval of at least two of the three members of the Auditing Committee; provided, however, that any bill or claim may be paid without the approval of any member of the Auditing Committee by a majority vote or written approval of a majority of all the members of the Executive Committee.

Section 6.—Duties of District Councilors

Each District Councilor shall be organizer, peacemaker and censor for his district. He shall visit each county in his district at least once a year for the purpose of organizing component societies where none exist, of inquiring into the condition of the profession, and of maintaining touch with the activities of the component societies of his district. He shall in writing make an annual report of this work and of the condition of the profession of each county in his district to the Council, which shall take such action thereon as it may deem best.

Section 7.—Expenses of Councilors and Officers

Councilors and officers shall be allowed railroad fare or mileage not exceeding 5 cents a mile, plus an allowance for maintenance expense of ten dollars a day, while absent from their places of residence; (a) in attending Association, district or county society meetings; (b) meetings of committees of the Association; (c) authorized councilor or officer visits to county societies; (d) and otherwise when on official business, authorized or approved by the Council.

Section 8.—Mail Ballot

The Chairman of the Council, at any time, may direct the Secretary to submit any urgent matter or question to the members of the Council by mail ballot, the question or proposition being prepared through conference of the Secretary with Chairman of the Council and the Chairman of the Executive Committee; and the vote of two-thirds of the members upon such question by mail or telegraph shall be binding upon the Council.

Section 9.—Offices

The Council shall provide and secure such offices for the Association as may be required to conduct its activities and business properly.

Section 10. — Employment of Secretary-Treasurer, Assistant Secretaries, Editor and Associate Editors

The Council shall employ a Secretary-Treasurer and an Editor, and, in its discretion, one or more Assistant Secretaries or Associate Editors. The terms of their employment shall be such as are satisfactory to the Council, provided, however, that no contract of employment shall, by its terms, exceed a period of three (3) years from the date of the organization meeting at which such contract is authorized.

Section 11.—Qualifications of Secretary-Treasurer and Editor

No person shall be eligible to the office of Secretary-Treasurer or Editor or Associate Editor who does not hold the degree of Doctor of Medicine, but membership in this Association shall not be a necessary qualification for the offices of Secretary-Treasurer, Editor or Associate Editor.

Section 12.—Executive or Field Secretaries or Representatives

The Council may employ one or more Executive or Field Secretaries or representatives, who need not be physicians or members of the Association. The duties of such a representative or representatives, if appointed, shall be determined by the Council by resolution.

Section 13.—Legal Counsel

The Council at its annual organization meeting shall appoint one or more legal advisers, giving each such title as may be deemed proper. It shall fix the amount of retainer and other fees.

The Council shall have the right to request the attendance of Counsel of the Association at any meetings at which it might desire his presence and advice, and at such meetings he shall call attention to matters in which the legal aspects may be of importance, and shall give such other opinions in special matters as may be requested of him by the Council.

The General Counsel shall present in writing as promptly as the same may be properly prepared, such legal opinions as may be requested by the House of Delegates, the Council or the Executive Committee.

CHAPTER VII.—COMMITTEES

Section 1.—Standing Committees

The standing committees of this Association shall be as follows:

(a) Scientific Work
(b) Public Policy and Legislation
(c) Medical Defense
(d) Medical Education and Medical Institutions
(e) Hospitals, Dispensaries, and Clinics
(f) Medical Economics
(g) Associated Societies and Technical Groups
(h) History and Obituaries
(i) Industrial Practice
(j) Postgraduate Activities

(k) Public Relations
(l) Physicians' Benevolence Committee
(m) The Reference Committees of the House of Delegates

until final adjournment of each regular session.

Section 2.—Standing Committees; How Elected; Term of Office

Unless otherwise provided in these By-Laws, each of the standing committees (except House of Delegates Reference Committees) shall consist of one member of the Council and two other members. Members of standing committees (other than House of Delegates Reference Committees) shall serve for a term of three (3) years. One member of each of these committees shall be nominated annually by the Council and if approved by the House of Delegates shall be deemed elected.

Section 3.—Report Procedure for All Committees

Regular standing and special committees of the Association may make investigations and surveys on authorization of the Council or House of Delegates, but all recommendations and reports of all committees (unless expressly otherwise provided in the Constitution or By-Laws) must be submitted only to the Council or House of Delegates. Other than as herein stated no committee is authorized to act for or represent this Association.

Section 4.—Advisory Groups to Standing Committees

To aid it in its work, each committee, if it so desires, shall have the power to appoint an Advisory Group to its committee, consisting of from two to ten members. Such advisory members, if present at a regular committee meeting, shall not have the right to vote.

Section 5.—Officers of Standing Committees

The chairman of each of these committees, except the Committee on Public Relations, shall be nominated and elected annually by the Council, by and with the approval of the House of Delegates. The chairman of the Committee on Public Relations shall be elected by said committee, subject to the approval and confirmation of the Council, and in the event of a failure to elect within sixty days after adjournment of the annual session the Council shall elect said chairman. Each of these committees shall, each year, except as otherwise provided in these By-Laws, at its first meeting or official consultation, during or following the annual session elect its own secretary.

Section 6.—Secretary-Treasurer's Notice to Standing Committees

The Secretary-Treasurer of the Association, within one month after the annual session, shall write the Committee Chairman of the preceding year, to call a meeting for organization and consideration of any business. The Secretary shall also send a copy of this letter to each of the other members of the committee.

Section 7.—Annual Reports of Standing Committees

At least sixty days prior to the annual session, each of these committees shall submit a written report to the Council on its work during the preceding year, the same to be printed in the Pre-Convention Bulletin as otherwise provided.

Section 8.—Committee on Scientific Work

The Committee on Scientific Work shall consist of the Secretary-Treasurer, the secretaries of the sections on general surgery and general medicine and three other members to be elected by the Council, each of these three members to serve three years, one member being elected each year. The Secretary-Treasurer shall be chairman.

This committee shall determine the character and scope of the scientific proceedings of the Association for each session, and shall invite the guest speakers, subject to the instructions of the Council.

At least thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers and discussions shall be presented.

This committee shall have one joint session with the section secretaries, at a time and place to be designated by the chairman of the committee, at least forty-five days prior to the annual session, to coordinate more efficiently the various activities of the Association at its annual session. The chairman of the local committee on arrangements shall be invited to attend this meeting.

Section 9.—Committee on Public Policy and Legislation

The Committee on Public Policy and Legislation shall consist of three elected members, and ex officio, the President and President-Elect.

The chairman of the committee, and in his absence, the President, shall act as chairman at the joint meetings of this central state group and of auxiliary county groups.

(a) *Functions of the Committee.* The Committee on Public Policy and Legislation and its auxiliary county groups shall represent the Association in securing and enforcing legislation in the interest of public health and of scientific medicine, subject, however, to the approval of the Council.

(b) *County Auxiliary Committees on Public Policy and Legislation.* Each component society shall appoint or elect three of its members as members of its auxiliary Committee on Public Policy and Legislation, designating one member as chairman; and the component society secretary shall send promptly the names and addresses to the Secretary of this Association.

(c) *Work of Auxiliary County Committees.* The Committee on Public Policy and Legislation of this Association, with the sanction of the Council, shall formulate the duties of these county auxiliary committees and supply each member with a copy of its suggestions and instructions. The auxiliary committeemen shall be accountable to their component societies and to the Council of this Association for

prompt and continued cooperation with the Committee on Public Policy and Legislation of this Association.

Section 10.—Committee on Medical Defense

The Committee on Medical Defense, subject to the approval of the Council, shall prepare plans and establish rules for the protection of the legal rights of members of this Association against whom suits for alleged negligence have been threatened or brought.

It may assist in the defense of any member sued for alleged negligence if the member was in good standing and had complied with the rules of the Council when the service on account of which suit was threatened or brought was rendered—provided that the committee determines that the position of the member merits such action.

Section 11.—Committee on Medical Education and Medical Institutions

The Committee on Medical Education and Medical Institutions shall serve in this State for the Council on Medical Education of the American Medical Association.

It shall keep in touch with the problems pertaining to medical education and to medical and other institutions of training for medicine and the healing art.

Section 12.—Committee on Hospitals, Dispensaries and Clinics

The Committee on Hospitals, Dispensaries and Clinics shall serve in this State for the Council on Hospitals of the American Medical Association.

It shall keep in touch with the problems arising in the fields of work of all types of hospitals, dispensaries and clinics giving special attention to those activities that are, or tend to become, a menace to the best interests of scientific medicine and of the profession and its members.

Section 13.—Committee on Medical Economics

The Committee on Medical Economics shall investigate matters affecting the economic status of doctors of medicine.

Section 14.—Committee on Associated Societies and Technical Groups

The Committee on Associated Societies and Technical Groups, subject to the instructions of the Council, shall endeavor to create proper liaisons between this Association and other state and national medical organizations, as well as with the organizations of related professions, such as dentistry, pharmacy and nursing. It shall also endeavor to bring about a proper understanding with non-medical organizations or groups of technicians and others whose work has a bearing on or is related to the practice of medicine.

Section 15.—Committee on History and Obituaries

The Committee on History and Obituaries shall compile and prepare for the archives and for the publications of the society suitable articles on the history of the Association and statements concerning deceased members. The Editor and the Secretary shall be members of this committee, ex officio.

Section 16.—Committee on Industrial Practice

The Committee on Industrial Practice shall keep in touch with matters and problems peculiarly connected with industrial practice.

Section 17.—Committee on Postgraduate Activities

The Committee on Postgraduate Activities, of which the Secretary-Treasurer shall be an ex officio member, shall use its best efforts to promote the postgraduate and clinical courses and instruction among the component county units of the Association.

The supervision of such postgraduate and clinical courses and instruction shall be carried on through the central offices of the Association, the Council being empowered to defray travel expenses of guest speakers and other costs incident to such work to such amount as in the judgment of the Council may be deemed proper. In the development of such postgraduate and clinical courses and instruction, it is stipulated that the component societies, through their constituted representatives, shall cooperate with the Standing Committee on Postgraduate Activities and shall also arrange to bear a proper proportion of the expense thereof of such amount as may be mutually agreed upon.

Section 18.—Committee on Public Relations

The Committee on Public Relations shall consist of the chairmen of the following committees: Public Policy and Legislation, Medical Economics, Associated Societies and Technical Groups, the President, President-Elect, and two additional members appointed by the Council.

The committee shall be responsible to the Council and the House of Delegates for all of its activities.

The Council or the Executive Committee may instruct the Committee on Public Relations, and outline to it certain policies and duties which shall be executed through the Director of Public Relations. In the event of any disagreement between the committee and the Council or the Executive Committee as to any activity or policy, the decision of the Council, after full discussion and hearing, shall be final.

The committee shall make recommendations to the Council for approval as to the time, the place, the number of meetings and the budget of the Department of Public Relations, provided that the Secretary shall call the first meeting of the committee within thirty (30) days following the annual meeting of the Association.

The Director of Public Relations shall be appointed by the Council (after consultation with the Committee on Public Relations) annually at the organization meeting of the Council. He shall serve

at the pleasure of the Council and the Committee. He shall act under the supervision and instruction of the chairman of the committee in such matters as shall be approved and sanctioned by the committee, and be responsible to the committee.

The Council shall arrange with the general counsel to give the committee all legal aid.

The committee shall annually at its first meeting elect its own chairman, subject to the approval and confirmation of the Council. The Secretary of the Association shall be ex officio secretary. A majority of the committee shall constitute a quorum.

Section 19.—Physicians' Benevolence Committee

The Physicians' Benevolence Committee shall consist of three (3) members whose appointments and terms of office shall be as provided in Section 2 of this Chapter.

The committee shall be responsible to the Council and the House of Delegates for all of its activities.

The committee shall administer those funds, of this Association, hereinafter designated as comprising the Physicians' Benevolence Fund.

The committee's administration of said fund shall be subject to the provisions of this section.

(a) The funds which may from time to time be allocated to it, from the general funds of the Association, by the Council, are the funds for this committee.

(b) All bequests, voluntary contributions, and donations, from any source whatever, that may be received by this Association for the express and implied purpose of aiding needy members, and

(c) All other funds from whatever source derived, except Accounts Receivable, payments for indebtedness to this Association, Dues and Assessments received by this Association, which the payer, donor, or other person transferring the funds, expresses the intent that such funds shall be for aid to needy members.

Funds contained in the Physicians' Benevolence Fund may from time to time be disbursed by the Physicians' Benevolence Committee.

Section 20.—Publication of Committee Reports in Pre-Convention Bulletin

Reports of the standing and special committees, as approved, deleted or modified by the Council, shall be published in a pre-convention bulletin or in the official journal of the month preceding the date of the annual session of the Association. Such reports must be in the hands of the Secretary-Treasurer at least sixty days in advance of the annual session.

If a committee fails to send in its report in proper time, the name of the committee and the names of its members shall be printed as above indicated, with a statement that the committee failed to send in its report, and the Council, subject to the approval of the House of Delegates, shall be empowered under such conditions to make such changes in the personnel of the committee as in its judgment may be deemed best.

Section 21.—Additional Committees

The House of Delegates and the Council are authorized and empowered to appoint special committees, with special instructions as to work to be undertaken, whenever it is deemed impractical or improper for the contemplated duties to be performed by a standing committee.

CHAPTER VIII.—ELECTION OF OFFICERS: TERMS

Section 1.—President-Elect—When and How Elected: Term of Office

The House of Delegates at each Annual Session thereof shall elect the President-Elect to serve until the adjournment of the final meeting of the House of Delegates at its next Annual Session. At the conclusion of the final meeting of the House of Delegates at its next Annual Session, such President-Elect shall assume the office of President, and serve as such for the term of one year thereafter, or until his successor assumes office.

Section 2.—Speaker and Vice-Speaker of House—When Elected: Term of Office

The House of Delegates shall at the Annual Session thereof elect a Speaker of the House of Delegates and a Vice-Speaker of the House of Delegates, each to serve for the term of one year, or until their successors are elected and assume office. The Speaker and Vice-Speaker shall be members of the House of Delegates at the time of their election.

Section 3.—Delegates to the American Medical Association

The House of Delegates shall elect delegates and alternates to the House of Delegates of the American Medical Association in accordance with the Constitution and By-Laws of that organization.

Section 4.—Officers Elected by House of Delegates

Those officers who under the Constitution are elected by the House of Delegates shall be elected at the second meeting of the House at the Annual Session thereof.

Section 5.—Election of Ballot: Number of Votes Necessary

(a) All elections of officers shall be by ballot; provided, that by a two-thirds vote of the members present and acting election by ballot may be waived.

(b) A majority of the votes cast shall be necessary to elect any officer.

(c) In case no nominee receives a majority of the votes on the first ballot the nominee receiving the lowest number of votes shall be dropped and a new ballot taken. This procedure shall be continued until one of the nominees receives a majority of all the votes cast, when he shall be declared elected.

Section 6.—Election of District Councilors

At least twenty-four hours prior to the second meeting at each annual session of the House of

Delegates the delegates from those districts in which Councilor vacancies are about to occur shall separately meet, and in each district the delegates shall elect a chairman and a secretary. At such caucus the delegates in each district shall by nomination, secret ballot and majority vote of the delegates present elect a district Councilor from such district to serve for the ensuing term. The chairman of the district delegation shall then report at the second meeting of the House of Delegates the results of the election, and when such report is made the member elected shall thereupon assume office as a district Councilor. The time and place of the caucus of each district delegation shall, in the absence of unanimous written consent by the delegates from the district fixing time and place, be fixed by the Speaker and announced at the first meeting of the House of Delegates at each annual session. In the event that at any district caucus no person receives a majority vote for district Councilor after repeated ballots, the chairman of the caucus shall report such fact at the second meeting of the House of Delegates and shall also report the names of all nominees submitted to the caucus, whereupon the House of Delegates shall proceed to elect from such nominees the district Councilor from such district.

Section 7.—When Terms of Office of Speaker, Vice-Speaker and Councilors Begin

The terms of office of the Speaker and Vice-Speaker of the House of Delegates (which terms are herein generally stated to be one year) and the terms of office of the Councilors (which terms are herein generally stated to be three years) shall commence immediately upon the adjournment of the last meeting of the House of Delegates of the Annual Session of the Association at which such officers are elected, and shall continue up to the adjournment of the last meeting of the House of Delegates at the Annual Session of the Association of the year in which the term of office ends.

Section 8.—Officers to Hold Office Until Successors Are Elected and Assume Office

Every officer shall hold office until his successor has been elected and has assumed office either in person or by announcement.

Section 9.—Vacancies in Office

(a) In case of vacancy in the offices of both President and President-Elect, the chairman of the Council shall act as the Acting President until a President is elected at the next Annual Session of the House of Delegates.

(b) The Council by appointment shall fill any vacancy in office not otherwise provided for in the Constitution or these By-Laws, which occurs during the interval between the Annual Sessions of the House of Delegates. Such appointee shall serve until the next Annual Session or until his successor has been elected and has assumed office.

CHAPTER IX.—POWERS AND DUTIES OF OFFICERS

Section 1.—Duties of the President

The President shall preside at all meetings of the Association.

He shall appoint all committees not otherwise provided for; he shall deliver an address at the regular session at such time as may be arranged, and shall perform such other duties as custom and parliamentary usage may require, or as the House of Delegates or the Council may direct.

He shall be the real head of the profession of the state during his term of office, and, as far as practicable, shall visit, by appointment, the various sections of the state and assist the Councilors in building up the component societies, and in making their work more practical and useful. The Council shall decide what portion of the expenses incurred on his official visits shall be paid by the Association.

He shall be ex officio a member of all committees of the Association.

Section 2.—Duties of the Secretary-Treasurer, Executive Secretary and Field Representatives

The duties of the Executive Secretary and Field Representatives may be such as are delegated to them by the Council, and may be any and all duties as are specified under the various provisions of this section.

(a) *Minutes.* The Secretary-Treasurer (who may also be referred to as Secretary or Treasurer) shall attend the general meetings of the Association, the meetings of the House of Delegates, of the Council and of the Executive Committee, and shall keep minutes of their respective proceedings in separate record books.

(b) *Custodian of Records.* He shall be custodian of all record books and papers belonging to the Association. He shall have the custody of the seal of the Association.

(c) *Contracts.* He shall countersign all contracts, agreements, conveyances, transfers or other instruments to which the Association is a party, the execution of which has been authorized by the House of Delegates or Council.

(d) *Checks.* The Secretary-Treasurer shall sign and issue checks or drafts only upon vouchers approved and signed by at least two of the members of the Auditing Committee or as otherwise provided.

(e) *Advertisements in Association Publications.* The Secretary-Treasurer, subject to instructions by the Council, shall carefully examine, approve, modify or reject all material for advertising in any of the publications of the Association, and shall, in all cases of doubt, refer such proposed advertisements to the Executive Committee or the Council for decision. He shall, with the approval of the Council or the Executive Committee, execute, for the Association, written contracts relating to advertising in the form approved by the Council, subject to instructions by the Council.

(f) *Registrar at Annual Sessions.* He shall provide for the registration of the members and delegates at the Annual Session.

(g) *Index Register of California Medical Licentiates.* He shall, with the cooperation of the secretaries of the component societies, keep a card-index register of all the licensed practitioners of the state by counties, noting the status of each in relation to his component society; and shall transmit a copy of this list to the American Medical Association, transmitting to its secretary each month a report containing the names of new members and the names of those dropped from the membership roster during the preceding month.

(h) *Register of Component Societies, Their Members and Officers.* He shall keep a register of all component societies, their respective officers, and of all members of the Association, with their addresses, and shall compile an annual directory of the same. He shall print in the January or February issue of the official journal the number of active members of each component society as of November 1st of the preceding year.

(i) *Notices.* He shall give all notices required by the Constitution and By-Laws of this Association, or by order of the Council, or of the Executive Committee, or by law.

(j) *Correspondence and Notifications to Committees.* He shall conduct the official correspondence, promptly notifying members of meetings, officers of their election, and committees of their appointment and duties, as outlined in the motions creating such committees. Such notifications shall be made in writing.

(k) *Assistants.* He shall employ and dispense with such assistants as may be ordered by the Council. The Council by resolution may outline the scope and duties of special employees acting under the Secretary-Treasurer.

(l) *Annual and Other Report Forms.* He shall supply all component societies with the necessary forms for making their annual and other reports to this Association.

(m) *Salary.* The amount of his salary shall be fixed by the Council.

(n) *Bond.* He shall give bond in such sum as may be fixed by the Council. The Association shall pay the premium on said bond.

(o) *Duties as Treasurer.* He shall as Treasurer demand and receive all funds due the Association, together with bequests and donations, and shall promptly deposit the same in one of the depositaries thereof; and shall keep a proper and accurate record thereof, as well as of all funds disbursed by the Association.

(p) *Audits and Reports.* He shall subject his accounts to such examination or audit as the House of Delegates or Council may order.

He shall annually render an account of his work, and of the state of the funds in his hands, and make a report on the same and of his work as Secretary-Treasurer to the House of Delegates. He shall in writing also make such other reports as the House of Delegates or Council may request.

(q) *Disbursement of Association Moneys.* He shall pay out the money of the Association only upon a check or draft as otherwise provided herein.

(r) *Other Duties.* He shall perform such other duties as the Council or Executive Committee may direct.

Section 3.—Duties and Powers of the Chairman of the Council

The Chairman of the Council shall preside at all meetings of the Council. He shall sign all contracts and agreements, conveyances, transfers or other instruments (other than advertising contracts) to which the Association is a party, the execution of which has been authorized by the House of Delegates or the Council. He shall sign all checks or drafts for the disbursements of funds of the Association. He shall, on behalf of the Council, deliver its annual report to the House of Delegates. He shall perform such other duties as may be imposed upon him by the Constitution or these By-Laws.

Section 4.—Duties of Vice-Chairman of the Council

The Vice-Chairman of the Council, in the absence or inability of the Chairman to act, shall be vested with all the powers and shall perform all the duties of the Chairman.

Section 5.—Duties and Powers of the Speaker

The Speaker of the House of Delegates shall preside at its meetings and shall perform such other duties as parliamentary usage may require. He shall appoint all committees authorized by the House of Delegates, unless otherwise provided.

Section 6.—Duties of Vice-Speaker

The Vice-Speaker shall act as Speaker in the absence of or at the request of the Speaker.

Section 7.—Duties of the Editor

The Editor and Associate Editor or Editors shall compile, edit and have charge of the official journal of the Association and such other publications as the Council or the House of Delegates may instruct him to undertake.

CHAPTER X.—FUNDS, PROPERTY, BUDGET AND ASSESSMENTS

Section 1.—Preparation of Budget

The Auditing Committee, prior to December 1 of any year, shall submit to the Executive Committee, for consideration at its December meeting, a budget under which the Association shall work in the fiscal year following the next annual session.

The Executive Committee, after consideration of the Auditing Committee's proposed budget, shall submit the same to the Council, prior to the spring meeting of the Council, with a report of its own containing suggested changes, additions or comments.

The Council in turn shall consider the two proposed budgets so submitted, and shall then make a

final draft of a proposed budget for the Association, to be submitted to the House of Delegates at the next annual session.

Section 2.—Dues

(a) The Council shall recommend to the House of Delegates the amount of the annual dues or assessments of Active, Associate, Affiliate and Retired members of the Association.

(b) Honorary Members shall not be required to pay any dues or assessments, annual or special.

Section 3.—Reduction of Dues

The House of Delegates may reduce annual dues of active members, as follows:

(a) Those active members who have been in the practice of medicine for less than one year (on the first day of the calendar year for which such dues are payable), may be reduced to one-fourth regular dues;

(b) Those active members who have been in the practice of medicine for less than two years (on the first day of the calendar year for which such dues are payable), may be reduced to one-half regular dues;

(c) Those active members who have been in the practice of medicine for less than three years (on the first day of the calendar year for which such dues are payable), may be reduced to three-fourths regular dues.

Section 4.—Annual Dues and Assessments

(a) *When Payable.* The annual assessment or dues shall be payable on or before January 1 of the year for which they are levied.

(b) *County Secretaries to Collect Dues.* The secretary of each component society shall cause to be collected and shall forward to the office of the Association the dues and assessments for its members.

(c) *Record of Fact of Payment of Dues.* The record of payment of dues and assessments on file in the office of the Association shall be final as to the fact of payment by a member and as to his right to participate in the business and proceedings of the Association and of the House of Delegates.

(d) *Dues of New Members; Amount Payable.* All doctors of medicine becoming active members of this Association shall pay to this Association the annual dues payable by active members for the period for which membership is obtained, except that the Council may, in its discretion, with respect to all new members who acquire membership after July 1 in each year, require payment of only one-half of the annual dues for said year. Such payment shall entitle such new member to all the rights of active membership in this Association until the end of the current calendar year.

Section 5.—Bequests, Legacies, Donations and Gifts

The Association may receive through the Council or for the benefit of the Association through any corporation which may be formed pursuant to the Constitution, such bequests, legacies, donations and gifts as the Council shall deem it proper and suitable to accept.

Section 6.—Funds and Moneys: Deposit and Withdrawal

All funds and moneys of the Association by whomsoever received shall be promptly forwarded to the Secretary-Treasurer of the Association and deposited by him in a depositary of the Association.

No demands or claims against the Association shall be paid and no funds or moneys of the Association withdrawn from any depositary thereof except upon written voucher approved by the signature of at least two members of the Auditing Committee or by a majority vote or written approval of a majority of all the members of the Executive Committee on check or draft signed by any two of the following: The Chairman of the Council; the Vice-Chairman of the Council (only in the absence of the Chairman); Chairman of the Auditing Committee; the Secretary-Treasurer.

Section 7.—Revolving Fund

A revolving fund in such amount as may from time to time be fixed by the Council shall be deposited with the Secretary-Treasurer from which fund immediate cash demands may be paid.

Section 8.—Surplus Funds From Journal and Publications

On authorization therefor by the House of Delegates or the Council, any surplus funds arising from the operation of the official journal or other publications of the Association may be applied and used for any purposes deemed suitable or may be delivered and paid over to any corporation which may be formed pursuant to Article VIII, Section 1, of the Constitution.

CHAPTER XI.—REFERENDUM AND PETITION

Section 1.—Reference of Resolutions to Vote of Members

The House of Delegates may at any time, by a majority vote of those present, refer any resolution or motion pending before it to all of the active members of the Association for their vote for or against such resolution or motion. The Council may, by a two-thirds vote of all of its members and at any time within thirty (30) days after action was taken, refer any resolution or motion adopted by the House of Delegates to all of the active members of the Association for their vote for or against such resolution or motion. In addition, the Council may at any time, by a two-thirds vote of all of its members, submit any resolution or motion pending before it to all of the active members of the Association for their vote for or against such resolution or motion.

Section 2.—Form of Referendum: Arguments

The body referring any resolution or motion to the active members of the Association may, in the motion of reference, determine the form of the question to be submitted. In the event the motion of ref-

erence does not determine the form of the question to be submitted, then the form thereof shall be fixed and determined by the Council. Written arguments for and against the resolution or motion, not exceeding 1000 words each, may be submitted by any member of the Association to the presiding officer of the referring body within fifteen (15) days of the vote of reference. Such presiding officer may choose one argument on each side and same shall then be printed and mailed with the ballots.

Section 3.—Manner of Voting; Time of Voting; Canvass

All references to the membership under this article shall be by mail ballot. The time within which each member shall cast his vote may be fixed in the motion of reference, and if not so fixed shall be fifteen days from the date of mailing ballots. Each vote must be in writing and the same must be placed in a sealed envelope bearing on the corner thereof the name of the voter. The envelope shall be mailed or delivered to the Secretary's office. The canvass thereof shall be made by a committee on referendums to be appointed, in the case of reference by the House of Delegates by the Speaker of the House, and in the case of reference by the Council by the Chairman of the Council. The Secretary shall deliver to such committee all ballots timely received, and the committee shall canvass the vote and report the results thereof immediately to the Secretary.

Section 4.—Effect of Referendum

To be considered adopted, any resolution or motion submitted to the membership by referendum shall require the same proportionate affirmative vote of those voting that such resolution or motion would have required to be adopted by the body (House of Delegates or Council) from which such resolution or motion was referred. Any resolution or motion submitted to a referendum and adopted shall have the same force and effect as though adopted in the body from which it was referred, and shall be considered as having been so adopted by such body. A referendum shall not be effective or binding unless a majority of the active members vote thereon.

Section 5.—Petitions

Any 100 active members or any component society may petition the House of Delegates or Council on any matter and such petition must thereupon be heard and considered at the next ensuing regular meeting of such body.

CHAPTER XII.—MISCELLANEOUS

Section 1.—Ethics

The principles of medical ethics as promulgated from time to time by the American Medical Association and by the California Medical Association are and shall be the principles of medical ethics of this Association and the component societies thereof, and shall regulate and govern all members thereof.

Interpretation of ethics about which any controversy may arise or exist shall be submitted to the Council of this Association, and its interpretation and ruling thereon shall be final.

Section 2.—Rules of Order

In the absence of any provision in the Constitution or these By-Laws, all meetings of the Association, of the House of Delegates, of the Council, and of committees shall be governed by the parliamentary rules and usages contained in the current edition of Roberts' "Rules of Order."

CHAPTER XIII.—AMENDMENTS

Section 1.—Amendments—Vote and Procedure

These By-Laws may be amended by the House of Delegates at any meeting of any session thereof by the affirmative vote of at least two-thirds of the qualified members thereof present and acting; provided, that any proposed amendment has been submitted in writing to the House of Delegates at least twenty-four hours previous to being voted upon.

CHAPTER XIV.—REPEAL OF ALL EXISTING BY-LAWS

Section 1.—Repeal of Existing By-Laws

All chapters and all sections and parts of all chapters of the existing By-Laws of this Association are hereby repealed.

Regional Medical and Surgical Institutes

For this fall and winter the California Medical Association, through its Committee on Postgraduate Activities, is preparing a new series of regional postgraduate programs which are planned to become an annual event. Each one of these medical and surgical institutes will have a two-day program sponsored by a local county medical society and staffed by one of the medical schools. A registration fee of five dollars will be charged which entitles the registrant to attend any one or all of the programs, no two of which are to be alike.

The first program will be known as the Santa Barbara Medical and Surgical Institute. This institute will be held in Santa Barbara, October 12, 13, 1950, sponsored by the Santa Barbara County Medical Society and staffed by the College of Medical Evangelists under the direction of Dr. H. M. Walton, chairman of the section on postgraduate and graduate medical education of the College of Medical Evangelists.

The Committee on Postgraduate Study consists of Dr. H. V. Findlay, chairman, with Drs. L. Gordon Fiske, Benjamin H. Huggins, E. L. Markthaler, and Neville T. Usher. The meetings will be held in the Santa Barbara County Medical Society club rooms in the Bissell Auditorium at the Cottage Hospital.

The program as at present planned follows:

SANTA BARBARA MEDICAL AND SURGICAL INSTITUTE

October 12, 13, 1950

Thursday, October 12

8:30-9:30 a.m.—Registration.

9:30-10:30 a.m.—Clinical-Pathological Conference—Carrol S. Small, M.D.

10:30-11:15 a.m.—Borderline Psychiatric Problem Cases—George T. Harding, M.D.

11:15-11:30 a.m.—Intermission.

11:30-12:00 noon—Postgraduate Activities of the C.M.A.—John C. Ruddock, M.D.

12:00-2:00 p.m.—Luncheon: Discussion groups with Institute speakers.

2:00-2:30 p.m.—Surgical Conditions in Infancy and Childhood—J. Norton Nichols, M.D.

2:30-3:00 p.m.—Differential Diagnosis of Jaundice — John E. Peterson, M.D.

3:00-3:15 p.m.—Intermission.

3:15-4:00 p.m.—Differential Diagnosis of Intracranial Tumor and Vascular Disease—Cyril B. Courville, M.D.

4:00-4:30 p.m.—Management of Obstetrical Complications —Ralph J. Thompson, M.D.

4:30-5:00 p.m.—Question and answer period.

7:00-9:00 p.m.—Dinner: "Medico-Legal Pitfalls in Medical Practice"—Louis J. Regan, M.D., LL.B.

Friday, October 13

9:00-9:30 a.m.—Use of Radioactive Iodine in Diagnosis and Treatment of Thyroid Disease—Mortimer E. Morton, M.D., Ph.D.

9:30-10:15 a.m.—Use and Abuse of Antibiotic Therapy—Albert G. Bower, M.D.

10:15-11:00 a.m.—Office Urology—Roger W. Barnes, M.D. Discussion, H. V. Findlay, M.D.

11:00-11:15 a.m.—Intermission.

11:15-12:00 noon—Hyperventilation — Physiological and Clinical Significance—James J. Short, M.D.

12:00-2:00 p.m.—Luncheon: Discussion Groups with Assembly speakers.

2:00-2:45 p.m.—Iatrogenesis in the Field of Cardiac Diseases—William Paul Thompson, M.D.

2:45-3:15 p.m.—Value of Anorectal Examination in General Practice—Malcolm R. Hill, M.D.

3:15-3:30 p.m.—Intermission.

3:30-4:15 p.m.—ACTH and Cortisone—Physiological and Therapeutic Considerations—E. Kost Shelton, M.D.

4:15 p.m.—Question and answer period.

On November 2 and 3, 1950, in Fresno, the second program, known as the Fresno Medical and Surgical Institute, will be held at the Hotel Californian in Fresno. This is being prepared by a committee with Dr. C. S. Mitchell, chairman, supported by Drs. C. A. Cabell, R. A. Donald, E. R. Freeto, G. W. Olson, T. A. Collins and Joseph Balkovitz.

The lecturers and conference leaders will be furnished by the University of California at Los Angeles School of Medicine. Dr. S. J. Weinberg, head of postgraduate instruction, has selected the subjects and lecturers in conference with the local committee.

The program Thursday, November 2, will be led off with a lecture, "Preventive Medicine," by Dr. Norman B. Nelson, associate professor of preventive medicine, at 9:30 a.m. He will be followed by Dr. Charles M. Carpenter, professor of infectious diseases, speaking on the subject of "Viral and Rickettsial Diseases." At noon there will be a round table conference and luncheon. In the afternoon Dr. Daniel G. Morton, professor of obstetrics and gynecology, will speak on a selected subject in obstetrics. The second subject for the afternoon will be "Radiology" by Dr. Raymond L. Libby, associate professor of radiology.

On the second day, Friday, November 3, the morning session will be held at the County Hospital with presentation of surgical cases at 9:00 a.m., under the direction of Dr. William H. Muller, Jr., assistant professor of surgery. At 10:30 Dr. William N. Valentine, chief of the hematological section, will present a group of medical cases.

At the noon luncheon the matter of "Medical Preparation for Atomic Defense" will be discussed.

At 2 p.m., Dr. Samuel H. Bassett, chief of research section, will lecture on "Metabolism with Reference to ACTH and Cortisone." Dr. John M. Adams, professor of pediatrics, will close the session with discussion of a subject in the field of pediatrics.

The Riverside Medical and Surgical Institute is planned for January 1951. The program is now in the process of formation. Lectures will be from the staff of the Medical School of the University of Southern California under the direction of Dr. Ed-

ward Rosenow, Jr., director of postgraduate education, in conference with the Riverside County Medical Society Postgraduate Study Committee. This committee is headed by Dr. Franklin B. Mead, Dr. Helen Clark and Dr. Hugh Stephens.

The Sacramento Medical and Surgical Institute, scheduled for March 1951, will be staffed by the Stanford University School of Medicine under the direction of Dr. Wm. H. Northway, assistant dean. The meeting will be held under the auspices of the Sacramento Society for Medical Improvement. Dr. Herbert W. Jenkins, chairman of the local committee, will be assisted by Dr. Chas. J. Wallace, Jr., and others.

The Santa Rosa Medical and Surgical Institute will be held in Santa Rosa in March 1951 in the auditorium of the high school. The local committee is headed by Dr. W. E. Rogers, chairman, with Drs. Carroll Andrews, J. L. Spears, A. Morse Bowles, and Frank E. Sohler.

The program will be staffed by the University of California under the direction of Dr. Stacey R. Mettier, head of postgraduate instruction, University of California School of Medicine.

Further information regarding any of these institutes may be had from Dr. C. A. Broaddus, Director of Postgraduate Activities, 1036 N. Center Street, Stockton 3, California.

In Memoriam

BRAZELTON, CLARA M. HOLMES. Died in Oakland, July 20, 1950, aged 83, from chronic valvular disease. Graduate of Cooper Medical College, San Francisco, 1895. Licensed in California in 1896. Dr. Brazelton was a member of the Alameda County Medical Association, and a life member of the California Medical Association.

✤

EAVES, JAMES. Died in Oakland, July 3, 1950, aged 66, of a heart attack. Graduate of the University of Edinburgh Faculty of Medicine, Edinburgh, 1910. Licensed in California in 1912. Dr. Eaves was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

ELLIOTT, FRANCES P. Died in San Diego, July 12, 1950, aged 78, after a long illness. Graduate of Rush Medical College, Chicago, 1907. Licensed in California in 1921. Dr. Elliott was a member of the San Diego County Medical Society, and a retired member of the California Medical Association.

✤

FLAU, NORMAN C. Died near Barton Flats, July 18, 1950, aged 29, when his car plunged over a cliff. Graduate of the University of Illinois College of Medicine, Chicago, 1945. Licensed in California in 1948. Dr. Flau was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✤

SCHIMMENTI, JOHN M. Died in Oakland, July 19, 1950, aged 51, of a heart attack. Graduate of Columbia University College of Physicians and Surgeons, New York, 1923. Licensed in California in 1926. Dr. Schimmenti was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

THOMAS, VICTOR E. Died in Arcadia, July 11, 1950, aged 51, of a heart attack. Graduate of Cornell University Medical College, New York, 1927. Licensed in California in 1927. Dr. Thomas was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

WALSH, FRANK D. Died in Oakland, June 28, 1950, aged 75, of carcinoma of the rectum. Graduate of the College of Physicians and Surgeons of San Francisco, 1898. Licensed in California in 1898. Dr. Walsh was a member of the Alameda County Medical Association, and a retired member of the California Medical Association.

Questions and Answers about C. P. S.

Question: **Does C.P.S. pay for orthopedic appliances, cast materials, medications, materials used in injections, drugs, expensive dressings, or similar adjuncts to medical care in the doctor's office?**

Answer: No. These items are chargeable to the patient because they are not included in the benefits of C.P.S. contracts.

Question: **Are physiotherapy and diathermy paid for by C.P.S.?**

Answer: No. These services are not included in any C.P.S. contract.

Question: **Is it possible for a physician-member or members of his office staff (nurses, secretaries, technicians, etc.) to join C.P.S. without forming a C.P.S. group for enrollment?**

Answer: Yes. A C.P.S. group for physician-members and their staffs has been in existence for some time and it is always open to new members who qualify. The family dependents of such persons may also be included. To obtain additional information, contact the C.P.S. Physician Relations Department in San Francisco or Los Angeles.

Question: **What medical services does the C.P.S. fee for obstetrical cases include?**

Answer: The female subscriber member on a two-visit-deductible contract is entitled to obstetrical benefits, if delivery occurs aften ten consecutive months of membership. C.P.S. pays a flat fee to the physician for services which include prenatal, delivery and postnatal care, and laboratory procedures ordered in connection with the pregnancy. The first two visits, the mother's Wassermann examination, circumcision and care of the baby, are not included in the fee and should be billed to the patient.

Question: **How do I bill C.P.S. for accident cases where there is a possibility of third party liability?**

Answer: Follow the routine billing procedures. However, payment of the claim will be expedited if a short note accompanies the bill, indicating how the accident occurred and the possibility that there will be litigation or third party responsibility in regard to the medical fees.

Question: **What x-ray and laboratory services are provided by the medical-service-while-hospitalized contract?**

Answer: A C.P.S. member enrolled under this contract is entitled to the following x-ray and laboratory services, *if he is a registered bed patient in a licensed hospital and if he is eligible for medical benefits for the condition being treated:* x-ray examinations, urinalyses, complete blood counts, coagulation studies and smears which are done in connection with the ailment being treated. Under the *surgical* portion of the contract, this member also would be entitled to x-rays ordered by the physician in connection with fracture or dislocation cases, whether in or out of the hospital.

Question: **I have difficulty in securing the special veterans' prescription blanks. Must I use these in prescribing for veterans, and if so, where do I obtain a supply?**

Answer: It is not absolutely necessary to use the special prescription forms. You may use your own provided that you write in the veteran's name and claim number and also indicate that the bill is to be sent to the California Pharmaceutical Association.

It is also essential that just above your signature you write, "I am authorized to treat and prescribe for the above Veterans Administration patient."

Inasmuch as these requirements make necessary a considerable amount of extra writing, it is much more convenient to use the regular prescription form. Every pharmacy which is a member of the California Pharmaceutical Association, and which has signified a desire to fill veteran prescriptions, has a supply of these forms on hand, and will furnish them to you free of charge on request. A telephone call to your usual pharmacy will probably bring you a supply, but if the pharmacy is not a member and cannot inform you which pharmacies in your district are, write to the above association for additional information; the address is 356 South Spring Street, Los Angeles 13, California.

Question: **Do I have to report in detail all laboratory and x-ray procedures performed on veteran patients?**

Answer: Yes. Each veteran's treatment report is reviewed by a medical board and becomes a part of his permanent medical record. It is important, therefore, that all reports should be submitted in sufficient detail to constitute a file adequate for such a medical review and record.

Question: **Among my C.P.S. patients are a husband and wife who are not members of the same C.P.S. group. Both are employed. The husband is enrolled in the group where he works and the wife is enrolled where she works. Does this fact mean that I cannot base my fees on their combined income?**

Answer: No. The application of the C.P.S. income clause does not depend on the husband and wife both belonging to the same group. The income clause permits doctors to bill patients directly for the difference between C.P.S. fees and the doctor's usual fee for services rendered, *if annual gross family income exceeds $3,600.* Thus, if the gross income of a family is more than $3,600 per year, the doctor may bill them directly for the difference between his own and C.P.S. fees — regardless of whether the various family members are enrolled in the same or different C.P.S. groups.

NEWS and NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

Dr. Charles M. Carpenter, professor and chairman of the department of infectious diseases in the University of California at Los Angeles School of Medicine, last month was awarded a citation by the University of Rochester for distinguished service in the field of infectious diseases.

* * *

Orthopaedic Hospital, Los Angeles, will present the fourth in a series of short courses in the over-all care of **patients with poliomyelitis,** for physicians, October 9 through 12, 1950, aided by a grant from the National Foundation for Infantile Paralysis.

The course, under the direction of Charles L. Lowman, M.D., includes demonstration and discussion of all phases of patient care with emphasis given to coordination of services making up the treatment team.

* * *

Three courses designed for laboratory technicians will be opened by University of California Extension with the beginning of its 1950 fall semester during the weeks of September 11 and 18.

A refresher course for laboratory technicians will feature a series of lectures by various authorities. Lecturers and their topics are: Dr. Henry Henstell, hematology; Dr. Milton G. Levine, serology; Dr. Everett E. Lund, parasitology and protozoology; Leslie Siewert, bacteriology. A series of biochemical methods lectures is also planned. The course will begin September 13 at 7:30 p.m. at 1027 Wilshire Blvd. and will meet one evening each week thereafter.

A course in **clinical chemistry** for laboratory technicians will be conducted on the U.C.L.A. campus each Tuesday evening from 7:00 to 9:30, beginning September 19.

A course in **problems in serology** will be held in Wadsworth Hospital's medical library each Wednesday evening from 7:00 to 9:00 starting on September 20. This class, teaching principles and techniques of serologic reactions, will be conducted by Edwin T. Peterson, chief serologist of the Veterans Administration Hospital.

Information, class bulletins and advance enrollments are available from University of California Extension, Los Angeles 24, or 813 South Hill Street, Los Angeles 14. Enrollments may also be made at the opening session of each class.

SAN FRANCISCO

Appointment of **Dr. J. C. Geiger** as consultant in public health to the Surgeon-General of the Navy was announced recently by the Department of the Navy, Bureau of Medicine and Surgery. Dr. Geiger was called upon by Surgeon-General C. A. Swanson, rear admiral (MC) to give consultation service to naval medical activities in the San Francisco and Pacific areas.

SAN JOAQUIN

Dr. J. Frank Doughty of Tracy was elected president of the board of trustees of **California Physicians' Service** at the annual organizational meeting in San Francisco. Dr. Doughty, who last year was first vice-president of the C.P.S. board, succeeds Dr. Lowell S. Goin as president.

Programs for eight postgraduate lectures making up the 12th annual fall series have been announced by the **Stockton Postgraduate Study Club.**

All meetings except for the dinner meeting concluding the series are to be held in the occupational therapy building on the grounds of the Stockton State Hospital. The usual registration fee of $10 will be charged.

The program follows:

September 14, 1950: "Psychosomatic Medicine" — Dr. Franklin G. Ebaugh, professor of psychiatry, University of Colorado School of Medicine. Chairman, Dr. James J. Heffernan.

September 28, 1950: "Diagnosis of Operable Cardiovascular Lesions"—Dr. Mary Olney, associate clinical professor of pediatrics, University of California School of Medicine. Chairman, Dr. Louis Armanino.

October 12, 1950: "Clinical Physiology of ACTH and Adrenal Cortical Hormone"—Dr. Lawrence Kinsell, associate clinical professor of medicine, University of California School of Medicine. Chairman, Dr. Virgil Gianelli.

October 19, 1950: "Hyperthyroidism and Exophthalmos" —Dr. Edward Maumenee, professor of ophthalmic surgery, Stanford University School of Medicine. Chairman, Dr. Alfons F. Tipshus.

October 26, 1950: "Protein Metabolism"—Dr. Harold A. Harper, professor of biology, University of San Francisco. Chairman, Dr. William Brock.

November 7, 1950: "New Concepts Regarding Diagnosis and Treatment of Pancreatitis"—Dr. Andrew Conway Ivy, professor of physiology and vice-president of the University of Illinois.

November 30, 1950: "Regional Anesthesia"—Dr. Charles Fletcher McCuskey, associate clinical professor of surgery (anesthesia), University of Southern California School of Medicine. Chairman, Dr. John T. McNally.

December 14, 1950 (Dinner Meeting): "The Antibiotics with Special Reference to Bacterial Resistance"—Dr. George Cupp Griffith, clinical professor of medicine, University of Southern California School of Medicine. Chairman, Dr. C. A. Broaddus.

TEHAMA

Dr. Charles R. Milford has been appointed health officer of the city of Red Bluff. He succeeds Dr. James L. Faulkner in that position.

GENERAL

The fourth clinical session of the American Medical Association, which, according to official announcement, is "designed primarily for the general practitioner," will be held in Cleveland, December 5-8.

"Outstanding clinical teachers with recognized ability as speakers will headline the scientific demonstrations," the announcement said. "Actual cases will be presented and discussed. Diagnoses, treatment and preventive measures as they fit into daily practice will receive the greatest attention.

"Each clinical session will be limited to an attendance of 100 physicians. These small groups will make it possible for

POSTGRADUATE EDUCATION NOTICES

For more complete information as to fees and time of sessions address the institutions as listed.

SEPTEMBER 1950

University of Southern California, School of Medicine

Clinical Review of Internal Medicine—12 weeks full-time from September 11 to December 1, 1950.

Cardiology and Vascular Disease—12 months, full-time from September 11, 1950 to September, 1951.

Hematology—12 weekly, 2-hour evening lectures. Clinical application of newer diagnostic methods in cardiology. Given at Los Angeles County Hospital.

Recent Advances in Surgery, Obstetrics and Gynecology—Given in San Diego.

Electrocardiography—Given at Centinela Hospital, Inglewood.

University of California, San Francisco

Ophthalmology—September 11 through 15, 1950. Toland Hall, University of California Hospital. Address: Stacey R. Mettier, M.D., Head of Postgraduate Instruction Medical Extension, University of California Medical Center, San Francisco 22.

University of California at Los Angeles

Symposia on Therapy in Metabolic, Endocrine and Gastrointestinal Diseases—September 20 to December 13, 1950. Wednesday evenings, 8 to 10 p.m.

Surgical Anatomy—September to December, 1950.

Stanford University, School of Medicine

September 11 to 15.

Morning Courses: Monday, Tuesday, Wednesday, Thursday and Friday, 8:30 a.m. to 12 noon.

Course 1—General Surgery
Course 2—Acute Surgical Emergencies
Course 3—Surgical Anatomy
Course 4—Internal Medicine
Course 5—Electrocardiography
Course 6—Diseases of the Chest
Course 7—Pediatrics

Afternoon Courses: 1:30 to 5 p.m.

Course 8—Surgical Anatomy
Course 9—Proctology
Course 10—Fundamentals of Roentgen Diagnosis
Course 11—Fractures
Course 12—Internal Medicine
Course 13—Obstetrics and Gynecology

Address: Stanford School of Medicine, 2398 Sacramento Street, San Francisco 15, California.

OCTOBER 1950

University of California at Los Angeles

Recent Advances in Obstetrics and Gynecology—One week.

NOVEMBER - DECEMBER 1950

University of California at Los Angeles

Ophthalmology.

DECEMBER 1950

University of California at Los Angeles

Internal Medicine—9 months full-time, December 4, 1950 to September 1951.

JANUARY 1951

University of California at Los Angeles

Advanced Hematology—Eight lectures.

the general practitioner to enter actively into the discussion and to inquire about his own cases."

This year's selection for the annual General Practitioner Award, which has come to be regarded as one of medicine's highest honors and a definite step toward increasing recognition of the family doctor, will be made at the Cleveland meeting.

* * *

Announcement has been made by the American Goiter Association of the opening of competition for the **Van Meter Prize Award** for 1951, which will be given for the best essay submitted concerning original work on problems related to the thyroid gland. The recipient of the award will be given $300, and arrangements will be made for the author to present the essay at the annual meeting of the association in Columbus, Ohio, May 24-26, 1951. Two additional essays will be given honorable mention.

The competing essays may cover either clinical or research investigations; should not exceed 3,000 words in length; must be presented in English; and a typewritten double spaced copy in duplicate sent to the corresponding secretary, Dr. George C. Shivers, 100 East Vrain Street, Colorado Springs, Colorado, not later than March 1, 1951.

* * *

The California Society of Internal Medicine will hold its first annual scientific-social meeting in Yosemite, with headquarters at the Ahwahnee Hotel, on September 23 and 24, 1950. The scientific program will be held on Saturday morning and Dr. John Browne, professor of medicine at McGill University, will conduct a symposium on recent developments and experiences with cortisone and ACTH.

Physicians planning to attend the meeting may reserve accommodations by writing to George H. Oliver, traffic manager, Yosemite Park and Curry Company, Yosemite National Park, California. Applications should be accompanied by a $10 deposit for each person who wishes accommodations.

* * *

The board of regents of the **American College of Chest Physicians** has announced the institution of a cash prize award of $250 to be given annually for the best original article, preferably by a young investigator, on any subject relating to chest disease. The prize is open to contestants of other countries as well as those residing in the United States. The winning contribution will be selected by a board of impartial judges and the award, together with a certificate of merit, will be made at the annual meeting of the college which next year will be held in Atlantic City, New Jersey, June 7-10.

Rules for contestants may be obtained from the executive office of the American College of Chest Physicians, 500 North Dearborn Street, Chicago 10.

INFORMATION

The University of California Program in Cancer Research

MICHAEL B. SHIMKIN, M.D., *San Francisco*

Cancer is one of the most important problems of public health in the United States. Cancer, a group of diseases manifested by abnormal growth and behavior of cells, is also an engrossing biological phenomenon. For these reasons, the problem of cancer has attracted ever-growing concern and interest of the public and scientists.

It has been realized that the solution of the cancer problem can be reached only through research. Cancer research is not a discipline separate unto itself, but depends upon simultaneous and coordinated efforts of many scientific disciplines. Its progress is stimulated by fundamental advances in the basic sciences. Cancer research, in turn, makes its contributions to the wider areas of biology, biochemistry and related sciences.

The University of California, on its many campuses, occupies an outstanding position in its abilities to contribute toward the solution of the riddle of cancer. Many of its investigators have made noteworthy advances which have contributed to scientific knowledge regarding cancer. Several events occurred in 1947 which made it possible to strengthen further the cancer research program of the university. More important, the opportunities which occurred three years ago were seized and exploited by close teamwork between the administrative and the research authorities of the university.

1. The Legislature of the State of California indicated its interest in cancer and made an emergency appropriation of $250,000 to the university for cancer research. This allocation has been established on a continuing basis.

2. Important gifts to the university, particularly the Albert C. Hooper Fund and the Emma B. Schutz Fund, increased the endowed funds designated for cancer research at the university to over one million dollars.

3. The expanded and accelerated programs of the National Cancer Institute and of the American Cancer Society substantially increased national funds available for cancer research. In 1947, approximately $270,000 was granted or made available to the university by these two agencies, and the amounts have steadily increased, to $660,000 in 1950.

4. Establishment of the School of Medicine at the University of California in Los Angeles and the organization there of the Institute for Cancer Research, with a private non-profit trust called the California Institute for Cancer Research partially supporting it, expanded the cancer research program in the south.

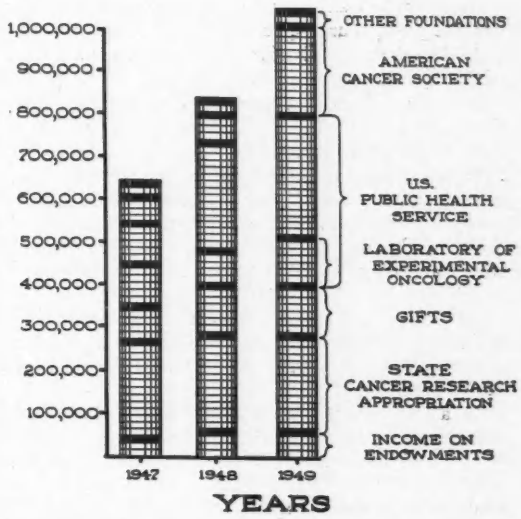

Figure 1.—Financial support of the cancer research program of the University of California, 1947-49.

5. The United States Public Health Service assigned one of the sections of the National Cancer Institute, the Laboratory of Experimental Oncology, to the University of California School of Medicine in San Francisco for the purpose of conducting a collaborative program in cancer research.

On the basis of these developments, the president of the university, in June 1947, called an all-university conference to review the cancer research program. The conference recommended a coordination of activities without encroachment upon the spirit of free inquiry which is essential for scientific endeavor. The president appointed three interlocking committees, widely representative of the main fields of biological research, to advise him on the policies and allocation of funds. These are the cancer research committees of the northern and southern sections and the university-wide Cancer Research Coordinating Committee. The major task of the committees is to stimulate and to coordinate investigations on the origin, prevention and cure of cancer by individuals and research agencies of the university, and to chart a program of cancer re-

Secretary, Cancer Research Coordinating Committee, University of California.

search that will encompass the important phases of the subject.

Further coordination of cancer research and related activities also occurred in the university's two schools of medicine. The School of Medicine in San Francisco organized the Cancer Research Institute, under the guidance of a cancer board, and the School of Medicine in Los Angeles established the Institute for Cancer Research.

The financial support for cancer research at the University of California, as shown in Figure 1, is derived from four major sources:

1. The State of California annual appropriation of $250,000;

2. Income on endowments and individual donations and gifts, which have risen from $97,000 in 1947 to $145,000 in 1949;

3. Grants and allocations from the National Cancer Institute of the United States Public Health Service, including grants made through the Department of Public Health of the State of California, which amounted to $200,000 in 1947 and increased to $440,000 in 1949; and

4. Grants from the American Cancer Society, including allocations from the California division, which have mounted from $69,000 in 1947 to $220,000 in 1949.

In addition, a grant of $125,000 was made from the Damon Runyon Fund for the two-year period 1948-50 to the California Institute for Cancer Research at the Medical Center of the University of California at Los Angeles, and grants from the Jewish Fund for Medical Research and from David R. Trattner and Associates total about $130,000.

These large sums do not include support for the essential training programs in research, encouraged through the medium of cancer research fellowships granted by the National Cancer Institute and the American Cancer Society, as well as by other foundations such as the Jane Coffin Childs Memorial Fund for Medical Research and the Damon Runyon Fund. Thirteen research fellows were working at the university in 1947, and the number increased to 21 in 1949. In addition, three clinical traineeships in cancer, and annual grants of $25,000 and $5,000, respectively, to the university's schools of medicine and dentistry in San Francisco, are available from the National Cancer Institute for the improvement of teaching in cancer.

One of the limiting factors in the development of the cancer research program has been the lack of physical facilities in which to carry on the work. The extensive building programs under way on the San Francisco and Los Angeles campuses, scheduled for completion in 1952, assure additional space for many of the activities. Several large construction grants have also been made specifically for cancer research, as shown in Figure 2. In 1948, the National Cancer Institute allocated one million dollars for the addition of a floor for cancer research to the new hospital and medical science buildings on the San Francisco campus, and in 1949 the School of Medicine at Los Angeles was extended

Figure 2.—Building program for cancer research at the University of California.

$700,000 for the construction of a wing on the school to house the Institute for Cancer Research. The State of California in 1948 appropriated $160,000 for the construction of the Cancer Research Genetics Laboratory at Berkeley.

As important to cancer research as any physical facilities or financial support are certain intangible requirements, indicated in Figure 3. A long-range view is one of these essentials. Although increased support of cancer research will increase the chances of success, the results are unpredictable and no estimate can be made of time required to achieve this solution. Continued progress is therefore based on continued adequate support on a long-term basis.

RESEARCH PROGRAM

The investigative approaches to the cancer problem may be divided into five main categories:

1. The study of *carcinogenesis*, or the cause and the formation of neoplastic growth. It is through the understanding of carcinogenesis that the basis of prevention and control of cancer may well be expected.

2. The study of the *nature of the cancer cell*, its chemical and physical characteristics, including its dynamic phases of metabolism, and how such characteristics differ from those of normal cells. Increasing information in this broad field will yield clues to rational approaches to the diagnosis and treatment of cancer.

3. The study of *cancer-host relationships*, or the effects of cancer growth on the organism. This approach involves the investigation of the natural history of the disease in animals and in man, the metabolism and other physiological reactions of cancer-bearing organisms as compared with normal

organisms. A better understanding of this field may reveal the basis for diagnostic tests for the presence of cancer, as well as improve the management and treatment of patients with cancer.

4. The study of the *diagnosis of cancer,* which may be divided into the improvement of existent methods, such as by roentgen examination and exfoliative cytology, and the introduction of new methods, depending on the clinical trial of information derived from the study of the cancer cell and cancer-host relationships.

5. The study of the *therapy of cancer,* which also may be divided into the improvement of existent methods of surgical and radiological treatment, and the laboratory and clinical trials of new chemical and physical agents. A thorough understanding of the natural course of the disease, and continual observation and follow-up of patients are implied in these investigations.

The University of California is conducting investigations in all these five segments of the cancer problem. Thirty-four separate research projects were being carried out in 1947, and this number increased to 69 during 1949. There is a natural division of effort depending upon the scientific disciplines applied to the problem. Research on clinical aspects is concentrated in the two schools of medicine. Investigations of the basic biological, chemical and physical phases of cancer gravitate to the appropriate academic divisions on the Berkeley and Los Angeles campuses. Agencies of the university concerned with cancer research also conduct research in other aspects of their respective scientific disciplines. Often the dividing line between such work and cancer research is a narrow and arbitrary one.

There are several large areas or groups of workers with the exclusive or chief aim directed toward research on cancer. These include the Cancer Research Institute, the Laboratory of Experimental Oncology and the Cytological Laboratory in San Francisco; the Donner Laboratory of the Division of Medical Physics, the Division of Biochemistry, and the Cancer Research Genetics Laboratory in Berkeley; and the Institute for Cancer Research on the Los Angeles campus. Other departments with extensive programs in cancer include the department of zoology in Berkeley, the divisions of pathology, obstetrics and gynecology, surgery, radiology and biophysics in the medical schools in San Francisco and Los Angeles, and the departments of biochemistry and zoology in Los Angeles.

The research activities of the School of Medicine in San Francisco are concerned mainly with the diagnosis, pathology, therapy and statistical evaluations of patients with cancer. These studies not only provide the essential foundation for other clinical research in cancer but in themselves are important contributions to the knowledge regarding the natural history and the effect of diagnostic and therapeutic measures on the progress of the disease.

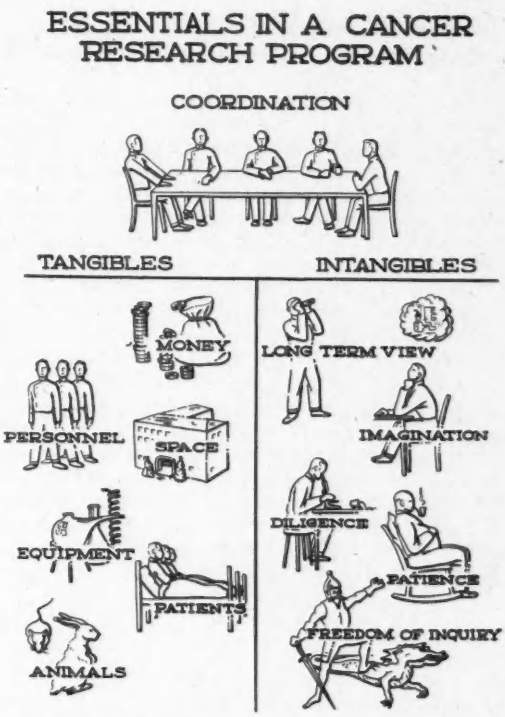

Figure 3.—Essentials in a cancer research program.

The Laboratory of Experimental Oncology has clinical research for its primary objective. The program is oriented toward the study of the physiology and biochemistry of the patients and how such changes are correlated with the clinical manifestations of the disease. Experimental chemotherapy, with emphasis on the mode of action of chemical agents, is an important phase of the efforts. At the same time, human neoplastic tissue is being studied and compared with normal tissues by physiochemical and immunochemical techniques.

The Cytological Laboratory is extending the application of exfoliative cytological techniques in the diagnosis of cancer. Detailed investigations and further elaborations of the method are being conducted on vaginal smears, aspirations from the nasopharynx, lung, bladder and stomach. This important area is of immediate impact not only on research but on clinical diagnosis, teaching, and services to the physicians of the state.

The program of the Donner Laboratory is concerned with three broad phases. The first is the study of metabolic processes of normal and cancer-bearing animals and tissues by means of substances into which radioactive materials have been incorporated. The second area attempts to obtain selective irradiation and destruction of cancer tissue by introducing radioactive elements into compounds that go selectively to specific tissues. The third field of investigation involves the study of effects of

radiation upon biologic material, with special reference to the effects of various products of atomic fission.

The Division of Biochemistry in Berkeley accentuates the study of biochemistry of normal and cancer tissue with special attention to protein metabolism, the structure of proteins in tissues, and the role of proteins in growth and tissue differentiation. Analogues of amino acids and related compounds are being explored for their possible retardative effects on cancer growth.

The program on the Los Angeles campus is being rapidly developed. The several departments of the School of Medicine within the framework of the new Institute for Cancer Research are conducting investigations on biochemical diagnostic tests in cancer, with special reference to antiproteolytic substances in the blood, and the possible presence of abnormal lipid, sterol, hormonal and other materials in the urine and blood of cancer patients. The department of chemistry and the department of zoology are investigating biochemical alterations in cancer tissue, and the relation of amino acids and hormones to the production and growth of cancer.

The growth and development of the cancer research program of the University of California can be gauged to some extent by the number of publications issuing from its investigators. In 1948, 28 separate reports from the university appeared in the scientific literature, while approximately 20 additional papers were in press. In 1949, 105 separate contributions to the scientific literature were published, and approximately 30 additional ones are in the process of publication.

Progress in cancer research throughout the world is so unmistakable that high optimism toward the eventual solution of the cancer problem is well justified. The developments at the University of California during the past three years have established the University of California as an important segment of the national effort toward the solution of the cancer problem. With proper tools and continued support, with imagination and patience both in the scientific and administrative aspects of the problem, the University of California can stand in the forefront of these inevitable achievements.

The Medical Center.

BOOK REVIEWS

CAUSE FOR CRUSADERS—A Hospital Fact Book. Prepared by the Council on Public Education, Association of California Hospitals, 26 O'Farrell Street, San Francisco 8, 1950.

The stated purpose of this pamphlet is to inform the public concerning "The truth about hospitals." The pamphlet achieves part of its purpose very well. The sections dealing with operating costs, health insurance and such matters contain largely factual information. The author must be commended on these portions, despite the fact that the casual reader would gain the impression that 100 per cent of the credit for modern scientific diagnostic procedures and for the improved health of the American public is solely due to hospitals.

There are other portions of the pamphlet which must give the thoughtful physician serious pause. On page 1, it is stated that,

> "At first all of our hospitals were voluntary, charitable institutions. Gradually they evolved into scientific centers for diagnosis and treatment."

Readers of the *Woman's Home Companion* for April 1950 will find a contrary statement by Albert Deutsch:

> "To a shocking extent hospital administrators tend to operate their laboratories as sources of profit to subsidize other hospital activities. They are maintained on the skimpiest of budgets, understaffed and have insufficient modern equipment. In many hospitals the laboratory pathologists must depend mainly on interns and residents for help. . . ."

On page 2, the author states that the purposes of the modern hospital are:

> "To alleviate suffering, to seek the cause and cure of disease, to preserve and restore health, to educate those who would serve humanity in the medical sciences. Such is the tradition of your community hospital."

It seems to your reviewer that the purposes of the modern hospital are to provide a bed wherein sick or injured individuals may lie when they cannot be taken care of at home. *All of the other claimed purposes are functions of the medical profession.* If the average community hospital and the average non-profit hospital would stop trying to be a university clinic, a research center and a reflection of Hollywood's idea of an ivory tower, the cost of hospital beds would drop and the public would benefit.

The author stresses the increasing number of therapeutic techniques requiring equipment "available only at hospitals." The House of Delegates of the C.M.A. recently handled this canard in adopting unanimously the resolutions from physicians in Alameda and Santa Clara counties dealing with (a) the new C.P.S. "medical care while hospitalized contract," and (b) the resolution on hospital coercion of physicians in regard to sending out-patients for drugs, special tests, etc. The fact of the matter is that 95 per cent of the special diagnostic and therapeutic procedures required in modern scientific medical care can and *are* being provided by physicians in private practice in their private offices, departments and clinics. The hospital has merely attempted to invade some of these fields either as a result of need for additional funds or from a power complex on the part of a few administrators.

The pamphlet states that there are 385 licensed general hospitals in California according to the State Department of Public Health (32,810 beds) which include 136 non-profit hospitals (bed capacity 16,148) according to A.M.A. registration. It also lists the vast number of federal, state and other governmental hospitals and beds, which outnumber the above over three to one.

On page 32, the question is posed, "What are the functions of a hospital?"; followed by this answer:

> "To give bedside care to the ill and injured; to provide training for professional personnel; to provide facilities for scientific research. More recently programs for preventive medicine, *home care*, and rehabilitation have been developed *as functions of the hospital.*"

Your reviewer suggests that this is an additional indication of the serious trend for hospital domination of medicine and medical practice both in and outside the institution. He trusts that the next edition of the book will be prepared in collaboration with a committee of the organized medical profession in California, the profession which converts a building with four walls, a roof and some beds into an institution wherein the sick and injured may be treated and cured.

* * *

CLINICAL ORTHOPTIC PROCEDURE — A Reference Book on Clinical Methods of Orthoptics. By William Smith, O.D., Associate Professor in Optometry and Instructor of Orthoptics, Massachusetts School of Optometry, Boston, Mass. The C. V. Mosby Company, St. Louis, 1950. $8.00.

The author is associate instructor in optometry and instructor of orthoptics and visual training at the Massachusetts School of Optometry. The book attempts to "present a system of simple orderly procedures for testing and treating functional anomalies of the binocular apparatus." There are no separate chapters on anatomy, physiology, visual psychology and ocular mechanics, it being rightly assumed that anyone interested in the practice of orthoptics should be familiar with fundamentals.

The book is easily readable and contains excellent illustrations of the various instruments used in orthoptics. The diagrams on the whole, however, are rather poor and in some instances as on page 35 the muscles are mixed up. There are numerous errors in the book such as the one on page 251 where the author states that limitation of down-and-out movement of the affected eye is one of the important signs of superior oblique palsy.

The author takes great delight in stating that cycloplegia prevents accurate diagnosis and believes that surgery is only valuable in a small percentage of squints. There are a tremendous number of cases presented, all of which end in complete cures.

A less prejudiced viewpoint, together with the avoidance of the many errors, combined with the author's ability to write a very readable book, might have resulted in an extremely valuable book on the subject. As it is, the book cannot be recommended for ophthalmologists or technicians because of the errors that are easily discoverable.

* * *

THE PATHOLOGY OF ARTICULAR AND SPINAL DISEASES. By Douglas H. Collins, O.B.E., M.D. (Liverp.), Reader in Clinical Pathology in the University of Leeds. The Williams and Wilkins Company, Baltimore, 1950. $7.00. 331 pages.

Most standard textbooks of pathology are limited in the amount of space given to the diseases of the bones and joints. Usually there is an adequate discussion of the tumors of bone in such standard texts, but the physician has much more occasion to deal with the diseases than with the tumors of the joints and the bones. Dr. Collins has for 15 years col-

lected specimens illustrating the various stages in the pathology of the articulating surfaces of the bones and in the bone structure itself. He has presented the result of this intensive study in this small volume. Perhaps the average physician does not care to delve into the fine points of diagnosis and classification of these rheumatic diseases, but if he does he will find in Dr. Collins' work the best short discussion of the subject.

Aside from clinical evaluation of a patient's condition there are three methods available to the physician for pinpointing the diagnosis, i.e., biochemical analysis, radiographic examination, and histological examination of biopsy material. No single approach will completely satisfy the requirements for correct diagnosis. The author has so arranged his material that the physician reading the radiologic interpretation of the joint films can then find a short concise discussion of the pathological process involved. He also gives the necessary chemical deviations for each disease. When necessary he uses simple diagrams to describe the course of the disease process and then illustrates with excellent photomicrographs the histopathology, and with occasional radiographs and photographs of the gross specimens he gives a complete picture. It is to his credit that he also emphasizes that more than one disease process can be present in a joint concurrently. This concept is important from the standpoint of treatment as well as classification and is perhaps too little emphasized.

Although it is not the purpose of this study to present a detailed discussion of the tumors of bone, there is a chapter which outlines the subject in such a fashion that with the aid of the bibliography the physician should be able to expand readily as the need might arise any particular section of the discussion. In general, the bibliographies are well chosen for each of the 17 chapters. The first three chapters deal with general anatomy and embryology, histology and physiology, and a short review of bone diseases. There is a short chapter on the relation of trauma to joint disease. In addition to the chapters on gout, osteoarthritis, and rheumatoid arthritis there is a good chapter on disorders of the joints in diseases primarily affecting other systems. This chapter includes discussion of atrophy and contractures, rickets, scurvy, purpura, hemophilia, endocrine disorders, syphilis, yaws, leukemia, and hypertrophic (pulmonary) osteoarthropathy. The inclusion of such a chapter makes the book more valuable as a reference source.

In reading this book one is struck with two concepts, i.e., that the joint diseases involving the peripheral joints and the joints of the spine should be treated separately, and that there are many more reasons for diseases of joints than just rheumatoid and osteoarthritis. There is an excellent chapter on rheumatoid arthritis from the standpoint of etiology in which the relation between rheumatoid arthritis and rheumatic fever, the relation between rheumatoid arthritis and osteoarthritis, the relation between rheumatoid arthritis and peripheral vascular disease, comparative pathology and experimental arthritis (in farm animals, rabbits, rats, and mice) and endocrine factors are discussed. For the rheumatologist, the radiologist, and the orthopedic surgeon this book constitutes important required reading. For other physicians and for medical students it should prove interesting and informative.

* * *

SAW-GE-MAH (MEDICINE MAN). By Louis J. Gariepy, M.D., Northland Press, St. Paul, Minnesota, 1950. $3.00.

Your reviewer enjoyed this book very much. Not only was it an interesting novel dealing with the progress of a boy of humble origin up through pharmacy, general practice and a specialty, but it also had woven into it many of the author's ideas in regard to the present-day social, economic and public relation problems of medicine.

He does this by emphasizing the importance of the general practitioner in the world of medicine, and the necessity for building good private physician-patient relationship (upon which all public relations rest) by means of competence, kindness, hard work, personal attention and fair fees.

Excellent reading for both physician and layman.

* * *

PENICILLIN—ITS PRACTICAL APPLICATION. Under the General Editorship of Professor Sir Alexander Fleming, M.B., B.S., F.R.C.P., F.R.S. Second Edition. The C. V. Mosby Company, St. Louis, 1950. $7.00.

One welcomes the second edition of Sir Alexander Fleming's book on penicillin, which is certain to present an authoritative discussion on the subject. In this edition Sir Alexander has called on numerous colleagues to write various chapters and the applications of this important antibiotic in every field are fully exposed. Penicillin is now so well known that its use has become pretty well standardized so one does not find a great deal that is new, but as a definitive reference book this treatise is certainly outstanding.

* * *

NAVAJOS, GODS AND TOM-TOMS. By S. H. Babington, M.D., F.I.C.S. Greenberg, Publisher, 201 East 57th Street, New York 22, 1950. $3.50.

A pleasant, worthwhile story of the author's travels in the Navajo Indian country while serving as physician to the Ansel Hall archeological expeditions.

The general reader will be interested in Dr. Babington's description of the remote, rugged but beautiful country, the scenery, the flora and fauna, the archeology and the old cliff dwellings. Physicians will enjoy his studies of the health of the primitive people, their sanitation or the lack of it and the methods of their medicine men. There are some very good details of these medicine men in action which the author was privileged to observe. Their treatment of the sick by means of chanting, incantations and by painting of symbolic pictures in the sand is psychosomatic medicine in its aboriginal form.

* * *

BREAST DEFORMITIES AND THEIR REPAIR. By Jacques W. Maliniac, M.D., Clinical Professor of Plastic Reparative Surgery, New York Polyclinic Medical School and Hospital. Grune and Stratton, New York, 1950. $10.00.

Mammaplasty has until recently been accepted by the general surgeon with considerable indifference. This has been due to a lack of appreciation of the patient's predicament, and perhaps more often due to a lack of knowledge of the proper operative techniques. In Maliniac's book, "Breast Deformities and Their Repair," the purpose is primarily that of showing the general surgeon, who has no special experience in the field, which are the safe procedures for correction of breast deformities. The book is composed of 11 chapters with 119 illustrations. It is well written and the illustrations are numerous and good. Operative procedures are well described and an extensive bibliography is given. One is impressed that the author has gone to considerable thought and effort in writing this book in a concise and yet thorough manner. The average surgical textbook does not cover this subject sufficiently for the general surgeon who is considering doing mammaplasty. This book does so very satisfactorily and it can be recommended to the general surgeon who may desire to become interested in mammaplasty.